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Searched for **http://www.stereo3d.com/driverc.htm**                                    **14** Results

* denotes when site was updated.

## Search Results for Jan 01, 1996 - Mar 26, 2004

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# Stereo 3D Driver Chart

Last update: July 24, 1999

A "3D-Flipping-Driver" just tries to force your VGA-card into interlace or page-flipping mode. It usually doesn't produce any stereo-information by itself. The application or game has to provide this. Exceptions are the drivers by ELSA, Wicked3D and ASUS which calculate the stereo perspectives from raw data delivered by popular 3D-API's such as MS Direct3D.

As far as I can tell the most advanced 'flipping-only' driver is currently 3D Win by i-Art.
BTW Ghazali's very useful H3D/eyeSCREAM-Activator-Utility is NOT a driver, it's just a switch!

| Driver | 3D-BIOS | 3DS-BIOS | 3D Win | ASUS VR100 | ELSA Revelator | LCD-BIOS & derivatives: nuvfrag, mpm3db, q-lcd, simuleyes-sdk | SG-TOGGLE | SSDI (standard stereosco device interface) |
|---|---|---|---|---|---|---|---|---|
| Purpose | for dos & windows | for dos & windows | for windows | drivers | drivers | for dos | for windows | for dos & windows |
| | flipping only | flipping only | flipping only | flipping & stereo calculation from Direct3D data | flipping & stereo calculation from Direct3D data | flipping only | flipping only | flipping |
| Developer | Kasan Electronics | Russian Shield | i-Art, also distr. by VR Standard Corp. | ASUS | ELSA | Donald Sawdai | AfterByte Software on behalf of Stereographics | Vrex and Donald Sawdai |

| | Kasan SE | Russian Shield | i-Art | ASUS | ELSA | LCD-BIOS page | Stereographics |
|---|---|---|---|---|---|---|---|
| Download Site | VMS, Kasan | | i-Art (update only, original driver CD required) | ASUS | ELSA | LCD-BIOS page | not yet; **developm ceased !?** |
| Screen modes | Interlace | Interlace | Interlace | Interlace & Page-Flipping | Software- Page-Flipping | Software- Page- Flipping | Interlace (plus White Line Code) / Page-Flipping & Interla |
| Supported Controller Types | proprietary ISA 8-bit slot card (old type I requires feature connector) **or** Kasan VGA-card with on-board controller | proprietary ISA 8-bit slot card ??? / proprietary ISA 8-bit (3D-Max ISA) | VGA-pass-through, WLC-VGA-pass through, | VGA-pass through | VGA-pass through, proprietary signaling for Revelator | serial-, parallel-, I/O-port, on board, some VGA-pass through / (there are drawbacks on VGA-pt controllers) For reversing stereo in LCD-BIOS swap the LL and RR numbers in LCDCtrl:/AALLRROO | WLC-VGA-pass through, VGA-pass through / ALL (almost), including VGA, on board, free view, anaglyph polarizati exotic stu (in the future) |
| Typical Refresh Rates | 80 to 150 Hz (S3) / usually anything your hardware can handle | 100 to 160 Hz | 50 to 150 Hz | 60 to 160 Hz or even higher when used with the right hardware and refresh-utility | 80 to 120 Hz (S3) | 80 to 160 Hz (S3) | anything your hardware handle |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Current Version** | v2.53 (1995) & v3.0 beta (1996), helloo Kasan, 96 is over, hellooo (you know that Jay Lenno-style "hellooo")<br><br>3DS: v2.0 new (1997) | (1999) | (1999) | (1999) | v1.31 (1996) | v1.0.0.3 (1997) | 1.0 (1997 |
| **Compatible Products** | Kasan 3D-Max | | Virtual Eyes and other VGA-pass-through devices, including SimulEyes (i.e. WLC) and 3D-Max (3D-BIOS still requ.) | Russian Shield Stereo Set | ASUS VR-100, VR-Joy, VR-Surfer, EyeFX, VGA-pt, VR97, Cyber3DVisor, Another I's<br><br>VR-Joy, EyeFX, i-Art, VGA-pt, VR97, Cyber3DVisor, Another I's<br><br>full support: Cyberboy, 3DSpex, Cybershades, Virtual Visor, limited support: VR97, Cyber3DVisor, Total3D, VGA-pt, VR-Joy and more | Stereographics SimulEyes and other VGA-pass-through products (the SimulEyes work with LCD-BIOS too, as long as there is a White Line Code) | Almost a (in the fu |
| **Emulations (backward compatibility)** | HMD's; (LCD-BIOS - can | HMD's; (LCD-BIOS - can | | | 3D-BIOS (partial) | | VR-BIOS and more |

| Image Formats | be difficult, but works sometimes) | be difficult, but works sometimes) | ??? | | | | |
|---|---|---|---|---|---|---|---|
| | Line sequential | Line sequential | Line sequential | Line sequential, Field sequential | Line sequential, Field sequential | Line sequential | Line sequentia Field sequentia side-by-s above-be anaglyph |
| Specific Software Titles (just a selection) | Hi-Octane, Magic Carpet, Nascar Racing | | Windows titles | almost all Direct3D | almost all Direct3D | Whiplash, Slipstream 5000, In Pursuit of Greed | Windows titles / Window titles |
| Windows desktop compatible | YES | YES | YES | YES | NO | NO | YES | YES |
| VGA-chipset-specific | YES | YES | YES | YES | YES | NO | YES | YES |
| VGA-Chipset compatibility | common chipsets from S3, Tseng, ATI, ARK, CL and | ATI, Cirrus Logic, Trident (up to 9750/9850 | | | | compatible to almost all chipsets, uses standard VGA and VESA modes | common chipsets, Windows desktop only, 8 bit (256 colors) only in | In the fut each chip will get w it needs, current |

| | | | | most cases version 1 for VRSu supports most common chipsets, which support interlace, including Tseng, A Matrox (! |
|---|---|---|---|---|
| some more, new: Matrox announced (don't count on it), must support VESA | AGP 3D), Tseng (up to ET6000), S3 (up to VirgeGX2), NEW: Matrox, intel, SiS, NVidia | TNT, TNT2 (ASUS only) | TNT, TNT2, Savage4Pro, Banshee (ELSA only) | |
| check VMS for a complete list | | | | |

Download LCD-BIOS and read the documentation. It's long and complicated, but you'll learn a lot about 3D and Shutterglasses in general. 3D-BIOS is also discussed in-depth. LCD-BIOS is the de-facto driver industry standard for LC-Shutterglasses. The new VESA 3.0 standard is promising however. There's a special version of LCD-BIOS for NuVisions 3D-SPEX called NuvFrag. Initially designed to run DOS-QUAKE, it can be used to force other programs into stereo mode too!!! I successfully tested it on Shattered Steel (i-glasses mode) and Terminal Velocity (CyberMaxx patch). (Syntax: nufrag lock run:"name of program"). It can also be used to **watch any "alternate line" stereo image** with any normal DOS-Image-Viewer. NUVFRAG adds Quake, HMD and hi-res 3D-Max compatibility to LCD-BIOS!!! NuvFrag was designed for **Nuvisions** own **3D-SPEX** glasses. It doesn't seem to work on serial port devices. Technically it contains the LCD-BIOS code and some inspiration by Marius who did the first Quake-LCD-BIOS hack.

Since most drivers doesn't complain if no controller is present it's possible to do some **drydock testing** on your video hardware **before** buying glasses. There is a 3D-BIOS emulation in LCD-BIOS, but this doesn't work in hi-res (640 and up), it doesn't work with windows and it doesn't work with "w3d.exe" or "cyberon.com". The original 3D-BIOS only runs if a Kasan 3D-Max ISA slot or a special Kasan VGA card is installed. "w3d.exe" and "cyberon.com" are only switches which call functions of 3D-BIOS. Without 3D-BIOS they're useoess.

**GO**
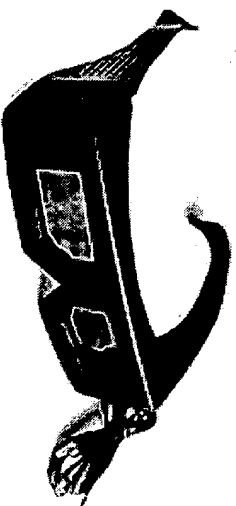
# The unofficial ASUS VR100 page

**Quick info (updated):**

ASUS VR100 is a wired 3D-shutterglasses system for newer ASUS-graphics-boards (V3400, V3800, V6600). The ASUS-drivers feature universal stereoscopic support for Direct3D-games and applications under Windows 95/98.

ASUS utilizes interlace and page-flipping modes. On the windows desktop the interlace mode can be used to watch 3D-images, -animations and -videos. Even more important: this feature enables lots of native stereo-applications and -games, such as Stereo Image Factory, 3DEM and H3D-Winquake.

The ASUS V3800 and V6600 TVR/TVR Deluxe boards with TNT2- and GeForce-chipsets feature a dedicated 3.5 mm stereo output for the glasses. On the V3800 Pure and on all V3400 boards the connector is missing. These boards require the VR100 Stereoscope Upgrade Kit which contains a VGA-pass-through controller.

The on-board controller of the ASUS V3800/V6600 TVR/Deluxe/Ultra boards is real fun. No additional cables, no power-adaptor, no VGA-dongle - ahhhhh what a relief. If only every board had such a connector! Since ASUS uses passive synchronization for the glasses there's less overhead. ASUS doesn't suffer from IRQ-problems and slip-ups as ELSA Revelator.

The glasses are identical to the classic APEC products and have large and clear LCD-panels. They fit over any prescribed glasses. The ASUS glasses come at an incredible low price of about $30 (without controller). They're also available as a bundle with the deluxe-version ASUS-V3800/V6600 boards at almost no extra cost.

The big drawback of the ASUS solution is the early development status of the Direct3D-stereo-drivers. There

is potential and there's a new beta-release every now and then. Nevertheless at this point (early September 99) they are just not as good and compatible as the Revelator and eyeSCREAM drivers !

The ASUS-combo (at least my V3800 TVR sample) does work with the ELSA-Revelator drivers though, but the stereo-orientation has to be set manually. It's somewhat tricky, but possible. This isn't nice against ELSA of course, but I've told them long ago that their drivers will work with many 3rd party glasses. I was surprised when ELSA de-protected their drivers recently. As long as their glasses dominate the market it's fine, but when low-cost glasses, like ASUS take over ELSA may run into problems.
BTW, the famous eyeSCREAM drivers will not work with the ASUS-glasses, since they require a sync-doubler!

Nevertheless, the ASUS-solution with on-board-glasses-controller and desktop-interlace-capabilities is the right choice for many stereo-addicts.

**Update (Dec. 30, 1999)**

ASUS released the V6600 TVR/TVR deluxe boards which have similar features as the V3800 line, but with GeForce chip and a huge software package, including Ulead Video Studio SE.
The latest driver 3.62 beta 5 provides native stereo support for OpenGL too and it works quite well. Stereo effect in GL is good, while there's still much room for improvement in D3D, at least under DX6. According to ASUS the driver is optimized for DX7. Further improvements, like better quality under DX6, are underway.
A nice feature in the driver package is a stereo video player which allows watching of 3D-video-tapes flicker-free on the PC using the ASUS glasses.

This review isn't intended for beginners. Please consult the Basics and FAQ pages if questions arise.

# Content:

This page was innitially released on September 4, 1999
Last update: Dec. 30, 1999

**Pro & Con**

**The Controller**

Flicker

The Glasses

Native Stereo-Software support

The universal Direct3D stereo driver

ASUS Stereo Video Player

ASUS Hardware and ELSA Revelator drivers

How to use other boards, glasses & even HMDs with

the ASUS drivers

H3D/eyeSCREAM and ASUS boards
- does it work?

Related Links:

ASUS-Germany
ASUS-Taiwan
ASUS-USA
ASUS-FTP-Germany (latest beta)

ELSA Revelator review
Wicked3D review
H3D review

**GO**
3D
HOME

**Test configuration:**

**Pro & Con**

| Pro: | Con: |
|---|---|
| **Glasses** | **Glasses** |
| + large LCD-panels | - wired |
| + large frame | - small nose-piece, may hurt after prolonged use |
| + fit over any prescribed glasses | - heavier than ELSA/Wicked3D |
| + inexpensive | |
| + standard walkman headphone dual-adaptor can be used to connect 2 glasses | |
| **On-Board-Controller for 'VR100G' (on graphics boards V3800 TV/Deluxe/Ultra)** | **On-Board-Controller for 'VR100G' ( on graphics boards V3800 TV/Deluxe/Ultra)** |
| + 3.5 mm standard connector | - always on - no auto-off |
| + no VGA-dongle | - no switches |
| + no power supply required | - no on/off |

| | |
|---|---|
| + easy to install | - no reverse |
| + glasses triggered by VSync, no IRQ/CPU overhead | - no sync-doubler |
| + compatible with some 3rd party software and drivers | - no line-blanker |
| + ELSA-compatible (image may be reversed) | - no DIN-3 connector |
| | - synchronization problems: dark stripe may appear on bottom of screen (like most consumer systems) |
| | - no above-below-splitscreen support |
| | - no H3D/eyeSCREAM drivers support |
| | - no IR range switch |
| **Upgrade-Kit-Controller 'VR100 Stereoscope Upgrade Kit' (VGA-pass-through)** | **Upgrade-Kit-Controller 'VR100 Stereoscope Upgrade Kit' (VGA-pass-through)** |
| + 3.5 mm and VESA mini-DIN-3 connector | - always on - no auto-off |
| + syncs to any interlace or page-flipping signal | - no switches |
| + internal board (doesn't require expansion slot) | - no on/off |
| + power supply by PC | - no reverse |
| + glasses triggered by VSync, no IRQ/CPU overhead | - VGA-pass-through may hurt VGA signal in higher frequencies |
| + compatible with some 3rd party software and drivers | - no sync-doubler |
| + ELSA-compatible (image may be reversed) | - no line-blanker |
| | - no H3D/eyeSCREAM drivers support |
| | - no above-below-splitscreen support |
| | - synchronization problems: dark stripe may appear on bottom of screen (like most consumer systems) |
| **Drivers (for ASUS V3400/V3800 boards only)** | **Drivers (for ASUS V3400/V3800 boards only)** |
| + choice of TNT, TNT2 | - early development stage |
| + high refresh rates available | - poor stereo-effects in many or even the most games |
| + high monitor compatibility | - compatibility problems |
| + may even work with some HMDs' (field- or line-sequential stereo on VGA-input) | - poor documentation |
| + no patches/stereo.cfg files required | - confusing stereo-options |
| + choice between interlace and page-flipping modes | - game controls active while in-game stereo-menu is open, this leads to key-conflicts |
| + interlace mode can be used on windows desktop for a wide range of applications | - no native Glide support |
| + very stable flipping, no IRQ-problems | - no native OpenGL support on V3400/V3800 yet |
| + 32bit color support | - no full horizontal resolution: image becomes smaller with larger stereo separation (black border on the left and right side) |
| + fast - performace drain just 20-30 % | - no H3D/eyeSCREAM compatibility |
| + On screen menu | - no 3rd party board support |

+ many options available during gameplay
+ in-screen/out-of-screen control
+ image viewer
+ image viewing directly from web-browser
+ **New**: native OpenGL stereo support in latest V6600 driver (good stereo effect)
+ **New**: very useful Stereo Video Player in latest V6600 driver

- no Voodoo 2 or 3 support
- no resolution override (as eyeSCREAM)
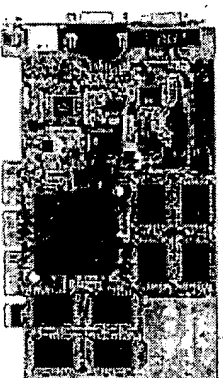- no laser targeting (as eyeSCREAM)

Like all shutterglasses the ASUS suffers from ghosting and doesn't work with LCD-monitors and -projectors.

## The Controller

### VR100G The on-board solution
### (V3800 TVR/Deluxe/Ultra - not available for V3400 and V3800 Pure)
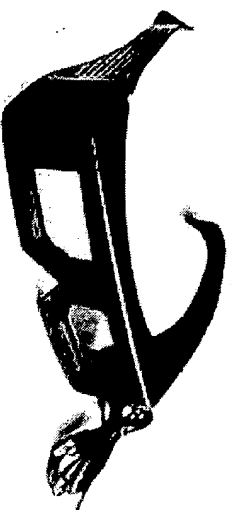
The VR100G package contains glasses only, no controllers, no additional cables, no software;

it requires an ASUS V3800 TVR/Deluxe/Ultra graphics board with 3.5 mm VR-Glasses-Out connector

The new ASUS TNT2 boards V3800 TVR, Deluxe and Ultra feature a standard 3.5 mm stereo connector. The glasses are directly connected, triggered and powered by the graphics board. No additional controllers/wires required. The connector is triggered passively by the Vertical Sync of the VGA-signal. Currently there is no VESA DIN-3 connector on the ASUS-boards.

Due to the low price and high availability the VR100G glasses are the No. 1 choice for controller-**homebrewers!!!**

**VR100 Stereoscope Upgrade Kit**
**(for V3400 and V3800 pure)**

http://web.archive.org/web/20000126235225/http://www.stereo3d.com/asus.htm
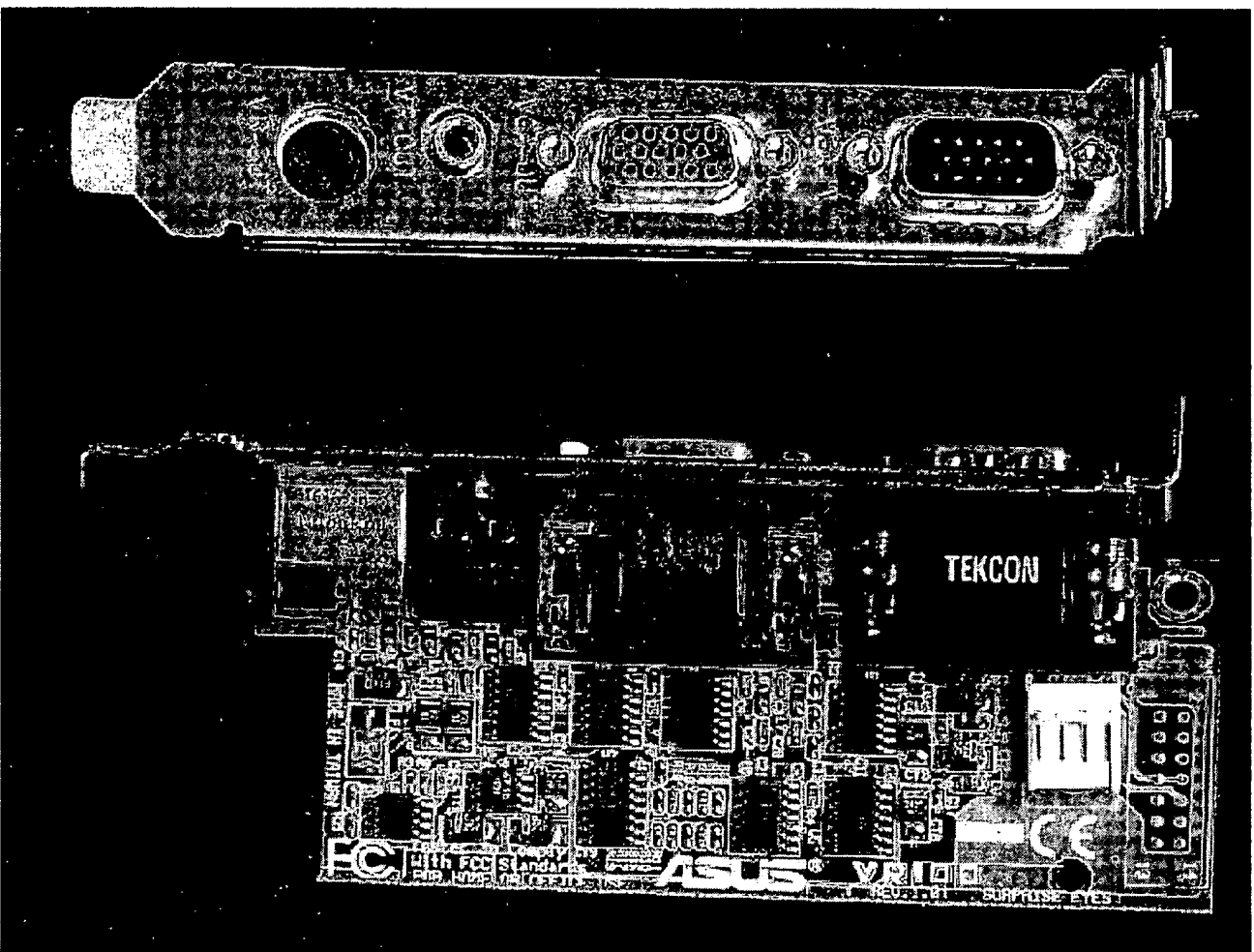
ASUS VR100 Stereoscope Upgrade Kit

Internal VGA-pass-through shutterglasses controller
with 3.5 mm and VESA DIN-3 glasses outputs

The upgrade kit consists of the glasses and an internal controller which doesn't require an expansion slot. The power comes from the PC via internal connection. There's a T-power cable in the box. The controller comes on a slot-sheet. There is one 3.5 mm and one VESA DIN-3 connector which can be used simultaneously.
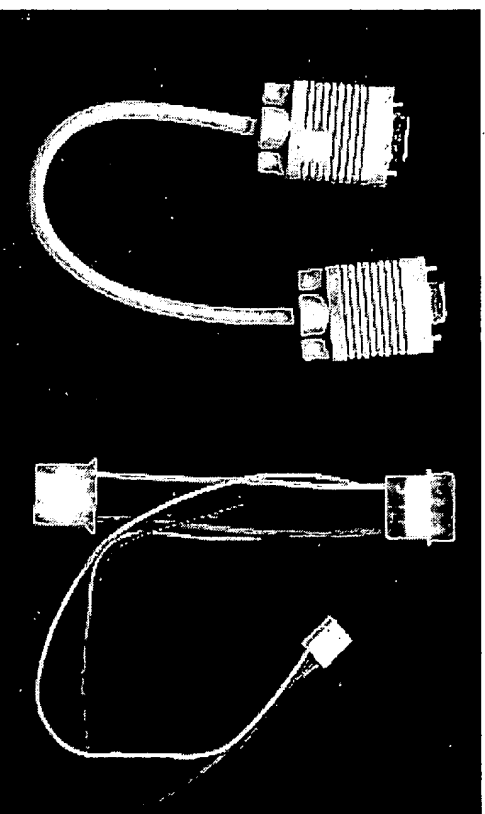


ASUS upgrade kit VGA-pass-through cable and power supply - floppy style

The controller is a plain autosync VGA-pass-through device which syncs to any interlace or page-flipping signal. Unfortunately there are no control buttons. It's always active and there's no reverse.
The upgrade kit works on any graphics board with standard VGA-connector.

## Flicker

Flicker isn't an issue. The ASUS drivers don't support refresh rates lower than 100 Hz.
A monitor with 80+ kHz horizontal and 120+ Hz vertical range is recommended.

## The Glasses
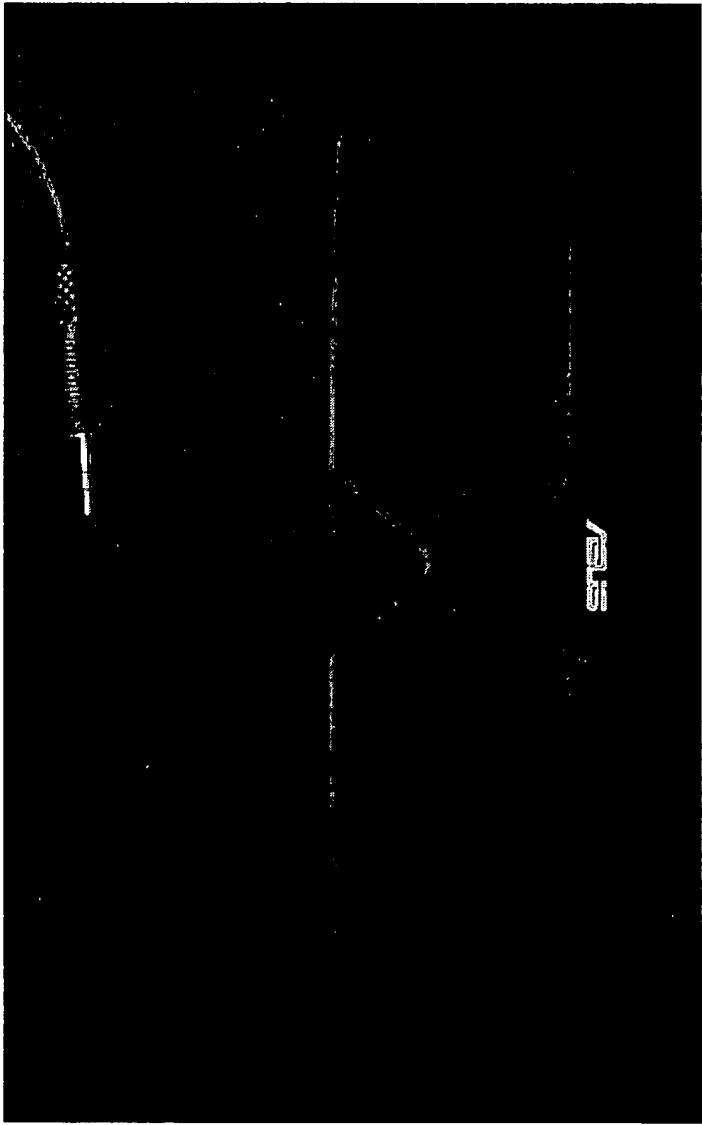
Shutterglasses classic style
ASUS VR100 with 3.5 mm stereo jack

Large frame, large panels, the ASUS-glasses are well suited for use with prescribed glasses. They're heavier than eyeSCREAM/ELSA, but not too heavy. The nose-piece could be more comfortable though. The glasses are identical with APEC VR97, Tetratel EyeFX and others.

Dimension check:

| Glasses | LCD-size | Weight |
|---|---|---|
| eyeSCREAM/H3D IR | 2 x 2.5 cm | 45 g |
| ELSA IR | 3 x 2.5 cm | 45 g |
| ASUS wired | 4.3 x 2.5 cm | 70 g |

**Please check the X-RAY Lab for a weight&size comparison of various shutterglasses.**

# Native Stereo-Software support



The ASUS-drivers come with a windows-desktop stereo-image viewer. This viewer can be used as a switch to put Windows into interlace-mode. Now you can use any native stereo-software which runs on the Desktop. Check the applications-page for programs with interlace-output format.
You can also use games such as Winquake, H3D-Winquake or Hexen2 in a Window.

# The universal ASUS Direct3D Stereo-Driver

The ASUS stereo-driver is an integral part of the ASUS VGA-board drivers. So whoever uses such a board and new drivers has the VR100 stuff in it.

These sections will be added later:
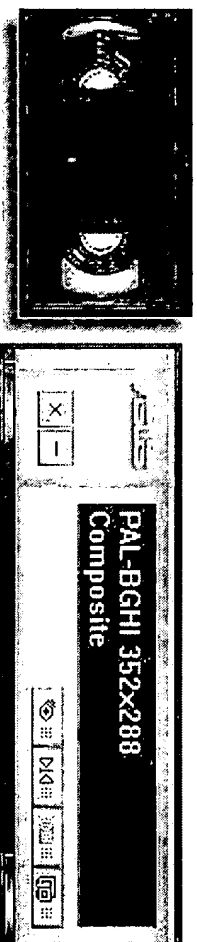
**Game and Application Compatibility**

under construction - more comments to be added later, check the pro-con table for now

**Options & Features**

under construction - more comments to be added later, check the pro-con table for now

# ASUS Stereo Video Player

**Dec. 18, 1999: ASUS StereoMovie Player - 3D-Video with PC-shutterglasses**



The video player can be found in V6600 driver V3.62 Beta 5.
Hopefully there will be soon a V3800 driver which contains the player also.
ASUS provided me with a stand-alone file and I tried the player on V3800.

Purpose:

- watching genuine field-sequential 3D-video-tapes (prerecorded or NuView) flicker-free on the PC using PC-shutterglasses

How to use:

1 - connect VCR or camcorder to ASUS board
2 - plug 3D-glasses into ASUS board
3 - start StereoMovie Player executable
4 - insert 3D-tape and press Play
5 - kiss your TV-shutterglasses good-bye

Features:

- works on all ASUS boards with video-in
- composite and S-Video input
- works in a window and full-screen
- 1x, 2x and full-screen zoom
- NTSC and PAL support

- full resolution, e.g. 720x288 per field in PAL-mode
- uses page-flipping, even on the desktop (amazing)
- perfectly stable, no problems/slip-ups with the flipping
- doesn't change current graphics mode
- works at current windows refresh rate
- doesn't require glasses driver
- no black interlace lines
- stereo reverse button (away-team to Capt'n - we finally found intelligent live down here!)
- stereo-/monoscopic button - allows watching 3D-tapes in half-res 2D

Problems:

- no digitizing/storing of 3D-videos
- aspect ratio in PAL not correct yet - image is too high

Test Configuration:

ASUS V3800 TVR, driver v2.25
ASUS V6600 TVR, driver v3.62 beta5
ASUS glasses
Win98
gfx modes tested:
1024*768 32bit 85 Hz
1024*768 32bit 100 Hz
800*600 32bit 120 Hz

Assessment:

I'll never watch a 3D-tape on the damn TV again - promise!

---

# ASUS Hardware and ELSA Revelator drivers

The ASUS TNT/TNT2 boards and glasses do work with the ELSA-Revelator drivers available for free from the ELSA website. Currently (August 99) the ELSA drivers deliver higher compatibility and quality for Direct3D games. The ASUS-controllers can't distinguish between left and right when using the ELSA-drivers. The images may be stereo-reversed, i.e. the left eye sees the right image and vice versa. Avoid this inversion at any cost! Since the

ASUS-controllers don't have a revese switch the only way to get it right is to hit the ELSA-stereo-on/off-hotkey until you 'catch' the right side.

# ASUS drivers on other boards and glasses

## Glasses from other manufacturers:

The ASUS boards and drivers deliver standard interlace and page-flipping stereo, also known as field-sequential format. There are many shutterglasses on the market which are checking the vertical sync signal on the VGA-output to synchronize the glasses. That's what ASUS own on-board controllers and upgrade-kits do.

## Boards from other manufacturers:

Up to now the drivers should work on ASUS boards only.

## ASUS-compatible systems:

- VR-Joy
- i-Art VirtualEyes
- i-Art Eye3D
- Tetratel EyeFX
- Another I's (?)
- NuVision 60GX-NSR
- CyberStuff Cyber3DVisor (!?)
- 3DTV stereo driver model-3000 (among other 3DTV models)
- APEC VR97

- homebrew VGA-PT or SD
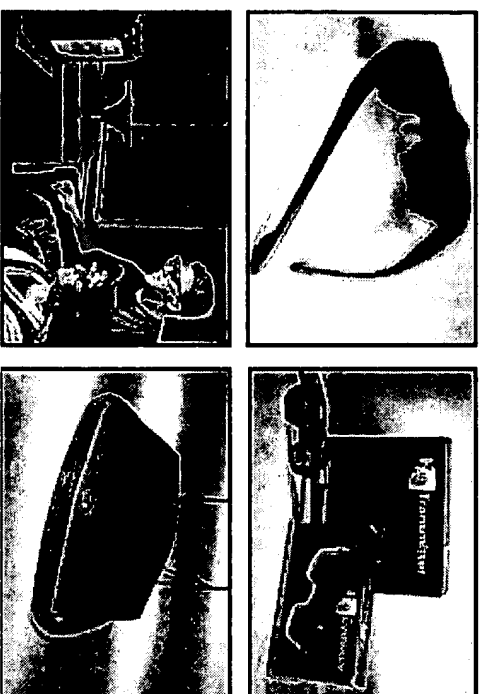- VRex VR-Surfer (Interlace mode only !?)

**ASUS-incompatible systems:**

- ELSA Revelator (trigger missing)
- H3D (color code missing)
- eyeSCREAM (color code missing)
- all parallel and serial port systems, e.g. 3D-SPEX, Cyberboy (port not triggered by ASUS drivers)
- 3D-Max and other ISA-board systems (board not triggered by ASUS drivers)

## H3D/eyeSCREAM glasses and ASUS boards
## - does it work?

## The H3D-Activator - a great tool - but not much help for the ASUS-drivers

Does it work? - Basically the answer is NO!

If you own some H3D/Wicked3D glasses you may wonder if they'll work on the ASUS boards using Ghazalis H3D-Activator.

Well they'll work using the Activator in Page-Flipping mode (also for ASUS interlace mode), but there are several **problems:**

- there must be no change in graphics mode after using the Activator or the glasses will drop out of stereo-mode; many games use different modes for menues and game, so there's a big problem
- it's hard or even impossible to get the stereo-orientation right
- the original ASUS glasses work under way higher resolutions and refresh rates. I tried to put the H3D/Wicked3D into page-flipping mode under 1024*768@hi-color@100 Hz - no use.
- what we need would be a stay-resident hot-key controlled version of the H3D-Activator which can be started from within the game

BTW the ASUS-controllers won't work on current Wicked3D boards and drivers, since they lack the required sync-doubler circuitry!
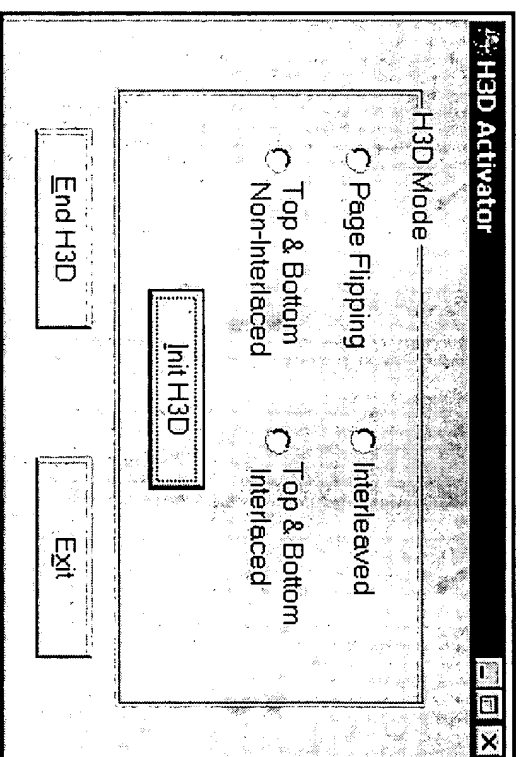
# Special thanks to ASUS-Germany and ASUS-Taiwan for their support



**Please consult the Shutterglasses Comparison Chart for a complete market-overview.**

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Christoph Bungert, Germany bungert@stereo3d.com.

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3/26/04

# ⑤ StereoGraphics Corporation

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## StereoGraphics and ELSA Team to Provide High Performance Stereo3D™ Visualization Solution for Autodesk and Kinetix Applications

**ELSA's ELSAview 3D™ and MAXtreme™ Enable Stereo3D Visualization of Drawings in AutoCAD®, Mechanical Desktop®, 3D Studio MAX® and 3D Studio VIZ™**

SAN RAFAEL, CALIF., January 25, 1999 — StereoGraphics, the world's leading supplier of Stereo3D visualization products and ELSA, a leader in high performance graphics, announced today that two software applications from ELSA, ELSAview 3D and MAXtreme, are now optimized to provide stereoscopic visualization of Autodesk, Inc. and Kinetix applications through the use of StereoGraphics' line of Stereo3D products and ELSA's high-performance GLoria cards for professionals.

Users of AutoCAD R14 and Mechanical Desktop from Autodesk and 3D Studio MAX and 3D Studio VIZ from Kinetix can now see drawings in Stereo3D though the use of StereoGraphics' CrystalEyes®, CrystalEyes Wired and Monitor ZScreen® products.

ELSAview and MAXtreme enable stereo exclusively with ELSA's GLoria™-XL OpenGL accelerators.

"This is the first time that full-featured, high performance stereoscopic visualization has been available to design engineers who rely on Autodesk and Kinetix products in their design environments," Said Bob Derezinski, vice president, sales and marketing, StereoGraphics. "The ability to view in Stereo3D with high performance ELSA GLoria accelerators will open the door to a faster and more intuitive design process for Autodesk and Kinetix users."

"Enabling Stereo3D in ELSAview and MAXtreme allows us to add substantial value to the solutions ELSA offers its customers with GLoria-XL," said Avi Singh, product marketing manager, ELSA Inc. "Autodesk and Kinetix users can now improve design capabilities and is a major step forward in improving design capabilities and speeding the end-to-end design process."

Users of StereoGraphics' visualization products can see drawings, models, animations and architectural designs in true Stereo3D, enabling faster decision making, reduced errors and less reliance on physical prototypes. This yields faster time-to-market and reduced overall design costs.

Stereo3D is the use of computer technology to recreate the way we naturally see depth -- stereoscopically. Stereoscopic viewing describes how we use both eyes -- each with a slightly different perspective -- to perceive depth and perspective in a physical environment. Stereo3D delivers the most realistic visual representation possible of complex digital models, giving architects, engineers and scientists the best possible understanding of three-dimensional information and yields levels of technical proficiency notavailable using a typical 3D view.

ELSAview 3D, a real-time 3D editor and viewer, is tightly integrated with AutoCAD R14 and Mechanical Desktop. In addition to Stereo3D visualization capabilities, ELSAview 3D now offers full- featured 3D capabilities such as light and material editing, clipping functionality, and improved navigation interfaces to users.

ELSA MAXtreme, a specialized driver for 3D Studio MAX R2 and 3D Studio VIZ R2, provides users with considerable performance and productivity gains in combination with ELSA GLoria professional graphic accelerators.

MAXtreme and ELSAview 3D are part of the ELSA Software Advantage in OpenGL and application drivers. ELSA's custom drivers and tools are available to customers free-of-charge and are standard components with every ELSA GLoria graphics board. The latest drivers are available online from the ELSA Web site, and are regularly updated on the ELSA WINNERware CD-ROM.

**About ELSA**

ELSA Inc. is a subsidiary of ELSA AG, a stock company based in Aachen, Germany. Founded in 1980, ELSA has built a world-class reputation in high-performance 2D and 3D graphics solutions in addition to a wide-ranging ISDN and videoconferencing product

**About StereoGraphics**

StereoGraphics Corporation is the world's leading supplier of Stereo3D™ visualization products. StereoGraphics' products allow engineers, scientists, architects and medical professionals to visualize large, complex data sets naturally and interactively. Today, over 60,000 users utilize StereoGraphics' products to reduce errors, enhance design review and accelerate time-to-market. StereoGraphics' products are sold worldwide through a network of authorized resellers. For more information on StereoGraphics, call 1-800-783-2660 or visit the company's web site at www.StereoGraphics.com.

###

# THE MAIL ARCHIVE

## java3d-interest

# Re: [JAVA3D] stereoscopic vision?

- From: Doug Twilleager
- Subject: Re: [JAVA3D] stereoscopic vision?
- Date: Tue, 27 Jul 1999 09:57:49 -0700

Java 3D currently implements stereo only in the OpenGL version of Java 3D.
It also implements it exactly as specified by OpenGL. This means that any card
that supports stereo, but not in standard OpenGL ways, will not be recognized
by Java 3D as supporting stereo. At this time, we have found no PC graphics
cards that support stereo through standard OpenGL mechanisms. We are still
looking though.

Doug Twilleager
Java 3D Team

```
> MIME-Version: 1.0
> Content-Transfer-Encoding: 7bit
> X-Priority: 3
> X-MSMail-Priority: Normal
> X-MimeOLE: Produced By Microsoft MimeOLE V5.00.2314.1300
> Subject: Re: [JAVA3D] stereoscopic vision?
> To: [EMAIL PROTECTED]
```

> 
> I use Java3D(OpenGL) for NT. But I have not gotten any runnable program or
> demo worked with shutter glasses by Java3D. As Java3D core team said in
> "Java3D API Specification" that Java3D did support Stereoscopic vision.
> Here is part of source of mine. But it is useless for stereoscopic vision.
> Maybe it would give us some hints.
> ........
> GraphicsConfiguration config=SimpleUniverse.getPreferredConfiguration();
> Canvas3D c= new Canvas3D(config);
> c.setStereoEnable(true);
> c.setLeftEyeInImagePlate(new Point3d(0.142f,0.135f,0.4572f);
> c.setRightEyeInImagePlate(new Point3d(0.208f,0.135f,0.4572f);
> ..........
> 
> Thank you in advance
> 
> 
> I am puzzled with this topic for several weeks. But now I start to suspect
> if Java3D could solve this question. Maybe we need lower-level API ???!!!
> Anyone who knows something about that, please give me some help.
> 
> 
> ----- Original Message -----
> From: Dennis Goetz <[EMAIL PROTECTED]>
> To: <[EMAIL PROTECTED]>
> Sent: Tuesday, July 27, 1999 5:00 PM
> Subject: Re: [JAVA3D] stereoscopic vision?
> 
> 
> I did use the Direct3d version when I compiled and ran the program ...
> Tan
> 
> mentioned having to set the stereoAvailable flag to true. Is there
> anything
> else that I need to be doing?  Has anyone gotten a Java3d program to work
> with Elsa shutter glasses?
> 
> 
> Thanks,
> Dennis Goetz
> 
> 
> p.s. anyone else having troubles posting stuff? I seem to have to post 2

> or
>
> > 3 times before a message actually makes it to the list..
>
> > > At 01:10 PM 7/27/99 +0200, you wrote:
> > >You don't have to change anything in your program, because the Elsa
> > driver
> > >does the stereo effect by extracting two different images according to
> > the
> > >values in the z-buffer. So it's all in the drivers - you cannot
> manipulate
> > >the stereoscopic view via the Java program.
> > >However, the current driver only works with Direct3D. There's no support
> > >for OpenGL yet. So make sure you are using the Direct3D implementation of
> > >Java3D.
> >
> > >Best regards,
> > >Roland Holm
> >
> > >[EMAIL PROTECTED]
> >
> > —
> > —————————————————————————————————————————————————————
> > >http://www.faw.uni-linz.ac.at
> >
> > >Johannes Kepler University Linz, Austria (Europe)
> > >Institute for Applied Knowledge Processing
> > >VR-Lab
> > —
> >
> > ======================================================
> > To unsubscribe, send email to [EMAIL PROTECTED] and include in the
> body
> of the message "signoff JAVA3D-INTEREST".   For general help, send email to
> [EMAIL PROTECTED] and include in the body of the message "help".
>
> ======================================================
> To unsubscribe, send email to [EMAIL PROTECTED] and include in the
> body

======================================================
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> of the message "signoff JAVA3D-INTEREST". For general help, send email to
> [EMAIL PROTECTED] and include in the body of the message "help".

=================================================================================

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of the message "signoff JAVA3D-INTEREST". For general help, send email to
[EMAIL PROTECTED] and include in the body of the message "help".

- **Follow-Ups:**
  - o **Re: [JAVA3D] stereoscopic vision?**
    - ▪ *From:* Oliver Schlüter <07/27/1999>
  - o **Re: [JAVA3D] stereoscopic vision?**
    - ▪ *From:* Dennis Goetz <07/27/1999>

  - Prev by Date: **Re: [JAVA3D] stereoscopic vision?**
  - Next by Date: **Re: [JAVA3D] stereoscopic vision?**
  - Prev by thread: **Re: [JAVA3D] camera based view model**
  - Next by thread: **Re: [JAVA3D] stereoscopic vision?**
  - Index(es):
    - o **Main**
    - o **Thread**

Reply via email to

Doug Twilleager

# Unofficial 3DTV Corp. page

**Quick Info:** 3DTV Corporation's mail-order service covers the whole world of Stereoscopic3D from software to hardware, from TV to PC, from photography to projection, from CD-ROM to VHS-tape. They offer products from their own production as well as 3rd party items under the original brand name or under the 3DTV brand name. 3DTV gave me the opportunity to review some of their stuff.

**Please note that most of these items are on the market for years now.**

**New, up-to-date products are in the pipeline and will be covered on this website as soon as they become available.**

**Click the images on this page to see them enlarged!**

initial release of this page: November 07, 1998

last update:

## Contents:

Basic 3DTV consumer packages: 3D-Theatre, 3D-Magic, PC 3-D TV

### controllers/transmitters:

Model 'PCP' parallel port controller

Model '2001' TV/video controller

Model 'Universal Stereo Driver' TV/Video controller

Model '3000' TV/Video and PC VGA-pt controller

TV/Video IR-transmitter/controller

Universal IR-transmitter - recommended as an add-on for 3rd party controllers

### glasses:

Stereo Visor/3D-Max wireless glasses

IR Pro wireless glasses - recommended

**software:**

3D-Magic Vol.2 video tape
3D-Magic CD-ROM

## A word on TV/Video shutterglasses controllers

The samples included 4 different shutterglasses controllers for TV/video alone. I'd like to remind you that there are no compatibility issues for TV/video controllers opposed to the dreadful situation in computer applications. All TV/video shutterglasses controllers I ever tested did their job well. No problems. No specific recommendations. All 3D-video-tapes, including the ones recorded with Nu-View work with any TV-shutterglasses controller on any TV-system, i.e. NTSC, PAL, Secam, etc.
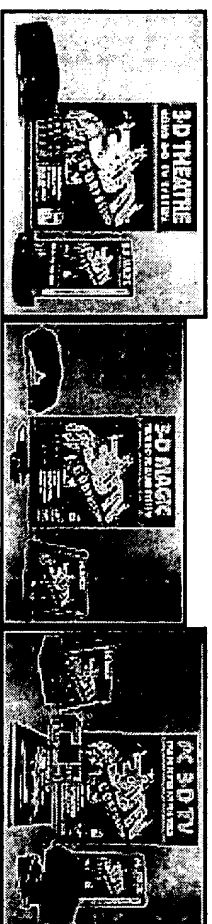
The basic 3DTV consumer 3D packages come in 3 flavors. **3D-THEATRE** for TV/Video, **3-D MAGIC** for the PC and **PC 3-D TV** which is a combination of both.

**My PC 3-D TV package for evaluation contained the following items:**

STEREO DRIVER MODEL 2001 for Video
3DTV MODEL PCP for the PC parallel port
IR transmitter
Stereo Visor 3DTV wireless glasses (3D-Max wireless type)
110 to 12V power adaptor by Panasonic
Cinch to Cinch cable
Scart to Cinch cable
Cinch gender changer
Parallel port pass-through cable

3D-Magic Vol.2 VHS video tape in PAL (NTSC also available)
3D-Magic CD-ROM

Documentation:
3D-ROM docu
3D-ROM hardware & software installation guide
Warranty card
Movie list
Professional products brochure
PC 3D TV Universal Stereo Driver docu
2 latest info-flyers

Booklet:
Stereoscopic Imaging Technology by Michael Starks, 98 pages, photo-copied

The 3D-camera depicted in the image above wasn't provided.

(actual content may be subject to changes, ask 3DTV for available options)

3DTV offers a gazillion of other products apart from these packages.

The actual content of the package may change over time. There should also be the option to choose between wired and wireless glasses.
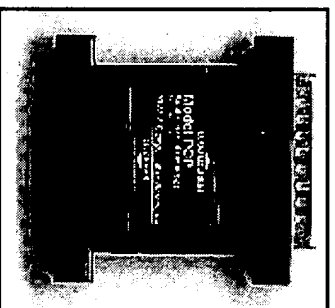


**The 3DTV MODEL PCP**

parallel port controller of the 3-D Magic and PC 3-D TV packages uses the same coding as other parallel systems like 3D-SPEX and

Cybershades. As such LCD-BIOS, as well as WinSPEX will work. Opposed to the other systems the adapter is powered by the parallel port rather than by an external power adaptor, making it my favorite parallel system.
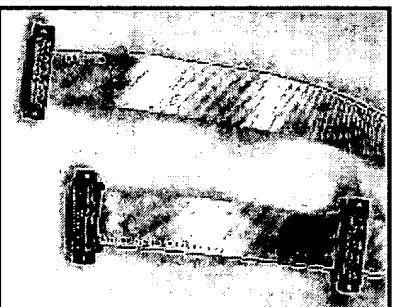


I was delighted to find a parallel-pass-through cable for the glasses-controller in the box. Unfortunately my printer - HP Laserjet 4p - behaved erratically after installation of the cable, even if the glasses controller was inactive.
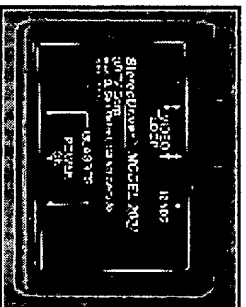


**The 3DTV STEREO DRIVER MODEL 2001**
supports all TV/Video applications in any TV-system. Computer applications are not supported.
The box has two 3.5 mm jacks for wired glasses or the the universal IR transmitter and a power LED, but no reverse switch.

For european users a Scart-to-Cinch cable is provided by 3DTV. It also powers the IR-transmitter/glasses-controller if the correct pin in the VCR or TV scart connection is powered. I tried the 4 different scart-plugs of my TV and VCR. Only 1 out of 4 provided the power. In the other cases the external power adapter has to be used.



## The PC 3DTV UNIVERSAL STEREODRIVER

supports TV/Video as well as computer applications.

The box has two 3.5 mm jacks for wired glasses or the the universal IR transmitter and a power LED, but no reverse switch. The computer-input gets it's sync from pin-4 of the parallel port. A serial cable is also available. It should behave exactly like other parallel or serial systems, such as 3D-SPEX, Cybershades, Cyberboy and so on. The pin-4 cable wasn't included in the box of samples. The VGA to cinch cable doesn't seem to work, since the signaling is much different.



## The 3DTV STEREO DRIVER MODEL 3000

supports TV/Video as well as computer applications. Combined with the VGA-pass-through cable it syncs to any VGA-signal. As such it behaves exactly like the famous homebrew VGA-pass-through controller or the i-Art Virtual Eyes controller. NO other functions such as line-blanking or sync-doubling included!

The box has two 3.5 mm jacks for wired glasses or the universal IR transmitter, a power LED and a reverse switch.
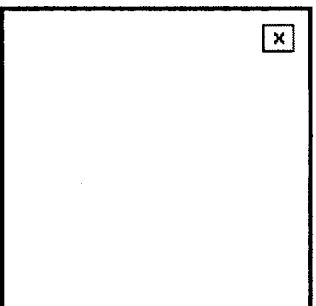
The provided VGA-pass-through to Cinch cable makes the 3DVT model 3000 a PC-compatible system.

[×]
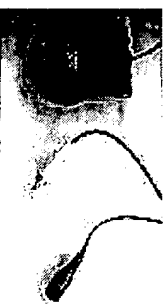
## The **3DTV VIDEO IR TRANSMITTER**

with Cinch jack connects directly to the VCR. No additional controller required for 3D-video, but it also connects to any controller with compatible Cinch-out, like the 3DTV models. The IR code works at least for 3DTV StereoVisor-, 3D-Max-wireless-, 3DTV IR Pro- and i-Art Virtual Eyes-Glasses. It does not work for H3D- and VRex VRSurfer-Glasses.
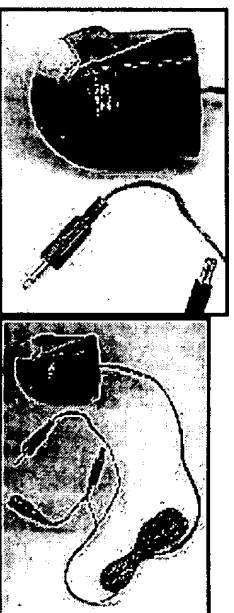
## The **3DTV UNIVERSAL IR TRANSMITTER**

with 3.5 mm stereo jack turns virtually any wired shutterglasses system into a wireless one. The IR code works at least for 3DTV

StereoVisor-, 3D-Max-wireless-, 3DTV IR Pro- and i-Art Virtual Eyes-Glasses. It does not work for H3D- and VRex VRSurfer-Glasses.

Makes a good companion for your homebrew controller also!

**Recommended !!!**



## The **3DTV STEREO VISOR**

is identical to the 3D-Max wireless glasses. Removing the 3DTV sticker reveals the 3D-Max logo.

This baby has large LCD-panels, a reverse button on the right side and offers above average comfort. It has problems too. There's a dreadful filter on the front which can fortunately be removed. What really bugs me are the timing problems which lead to red/purple color distortions in the lower 1/4 th of the screen. This happened under any conditions with both the universal and the TV IR controller on the TV-screen and on the computer-monitor in all modes. I don't know if this is a general problem or a problem with my sample. There may be a fix, but I don't

have the time to experiment around forever.



## The **3DTV - IR PRO**

wireless glasses.

Large LCD-panels, acceptable comfort, good quality, no timing problems, no reverse button.
They fit over prescribed glasses. If you have a very large head like me there could be some unpleasent presure behind the ears, but who has a head as large as mine anyway? I prefer them over 3D-Max-wireless, H3D and VRSurfer. They can't beat the i-Art wireless glasses though.
It listens to IR-signals from the 3DTV transmitters and presumably the i-Art transmitter.

Check the X-Ray page for more details.
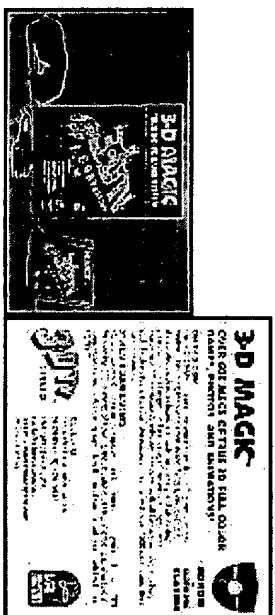
The packaging of the **3-D Magic CD-ROM**. Click to enlarge! Check back to this page again later for more details.
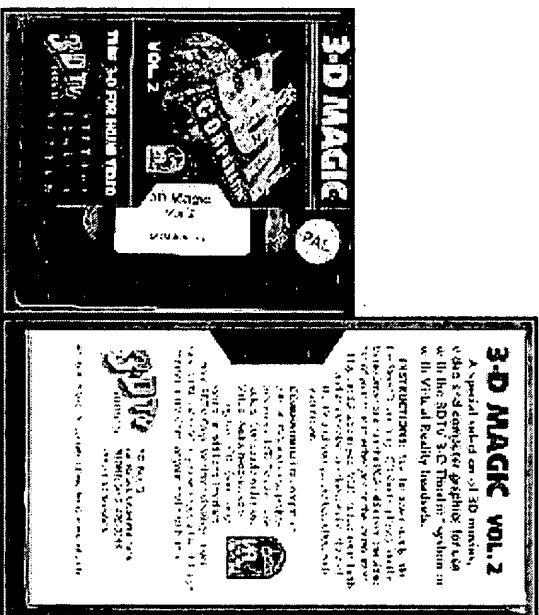
The packaging of the **3-D Magic video tape**. Click to enlarge! Check back to this page again later for more details.

**Special thanks to 3DTV Corp. for providing me with free samples.**

**Please consult the Shutterglasses Comparison Chart for a complete market-overview.**

Don't miss the rest of this 3D website!!!

GO **HOME** GO

Brand and product names are trademarks or registered trademarks of their respective holders.
Most images are "borrowed" from the official manufacturer sites.
The author can not guarantee the accuracy or topicality of the information given on this page.
Christoph Bungert, Germany bungert@stereo3d.com.

INTERNET ARCHIVE

# WayBackMachine

**Enter Web Address:** http://  [All ▼]  [Take Me Back]  Adv. Search

Searched for **http://www.stereo3d.com/3dtv.htm**  **17** Results

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| | | | Aug 22, 1999 *<br>Nov 14, 1999 | Mar 05, 2000<br>Jun 18, 2000<br>Oct 05, 2000<br>Oct 28, 2000 | Mar 03, 2001<br>Apr 06, 2001<br>Jul 08, 2001<br>Aug 30, 2001<br>Oct 31, 2001<br>Dec 11, 2001 | Jun 20, 2002<br>Aug 09, 2002<br>Dec 14, 2002 | Mar 08, 2003<br>Jun 04, 2003 | |

**June 25, 2000: They did it! The wait is over! ASUS D3D-stereo-driver breakthrough!**

**(updated July 5: game list)**

**ASUS Win 95/98 driver 5.16d RC2** - for VANTA2000/V3800/V6600/V6800/V7700 series - download here

With the latest driver release ASUS takes a leap forward in D3D-stereo quality and finally starts to close the gap to ELSA. There are still some minor problems, but this is the first driver from ASUS to impress me!

Please keep in mind that this is beta-stuff, so it may not work for your configuration yet. I tried V6600 and V3800. The V6600 works better.

Here's how ASUS describes the new driver:

*Release Notes*

*5.16:*
*1. New algorithm for stereoscopic computation.*
*2. New histogram chart in OSD for games utilizing Direct3D 6.0.*

**D3D**

Ohh, yes I believe there is a new algorithm. Overall D3D-stereo quality improved strongly and thanks to the histogram you're able to get the settings right this time. Like in the ELSA OSD (on screen display) you can see the Z-values of all objects on the screen. The monitor plane, marked with an E (for embossment) is also visible. Basically the new Asus OSD comes close to the one from ELSA, but doesn't match it yet.

The task of the user is to adjust the 'foreground' value in a way that most on-screen objects are distributed equaly over the z-range. The objects are represented as green columns. Usually the background has to be kept at 100, while the foreground has to be adjusted somewhere between 0 to 95. The histogram reveals that many (most?) games require a foreground-setting of 80 to 95!

What's missing in the ASUS driver is an option to do this adjustment automatically and dynamically throughout your whole

gaming session. ELSA has this 'autopilot' and calls it 'Dyna-Z'. Don't jump to the conclusion that ELSA is therefore superior. Direct3D on ASUS now looks equally terrific. It's not natural if the z-value-setoff changes all the time, so without it you may be closer to reality. Anyway ASUS should offer a similar feature in the next release.

You may check out ASUS own short-documentation for the D3D features here.

**Game results**

Here are the titles I've tried:

| | V6600 (GeForce) | V3800 (TNT2) |
|---|---|---|
| Tomb Raider 3 demo | O.K. | not tested yet |
| 3D Mark 2000 (DX7 - histogram didn't work, but great 3D) | O.K. | O.K. |
| Tower of the Ancients - demo | O.K. | O.K. |
| Rally Masters demo | O.K. | not tested yet |
| NFS - Porsche demo | O.K. | hangs for a moment every 2 seconds |
| Ultimate Race Pro retail | O.K. | not tested yet |
| House of the Dead | O.K. | O.K. |
| System Shock 2 retail (HUD compressed in upper half of screen) | O.K. | scrambled menu |
| Croc 2 demo (state of the art, a must see, even the menu is perfect, try this: D50 E50 F88 B100) | O.K. | not tested yet |
| Driver | O.K. | not tested yet |
| Klingon Academy demo (HUD compressed in upper half of screen) | O.K. | not tested yet |
| Codename Eagle demo | O.K. | not tested yet |
| Quake 3 (OpenGL) | O.K. | some missing or wrong textures |

## All looked terrific!

Older, pre-DX6 programs which looked poor on prior ASUS-driver releases now show great effects. The Gunship! demo produced heavy graphics errors, but maybe this can be salvaged by changing some settings. By the way, the NFS-Porsche demo is great for showing off stereo. Red is the dominating color and there is very little contrast, there's almost no ghosting.

### Backdraws

There are some details which still bug me:

- The OSD keys still collide with most game control keys and there seems to be no way to reconfigure them. The game keys aren't suppressed as long as the OSD is up. It's so hard to get the settings right while the whole screen is spinning and Lara jumps off the cliff.
- The OSD seems to work in alternate line format even in page-flipping-mode, so each eye sees only half of the lines.
- The histogram doesn't work in DX7 titles yet! All older DX-versions are supported though.
- There seem to be no stereo on/off hotkey, you have to go to the OSD and level down the depth to achieve this.
- There are only presets for a few games and they use out-of-screen effects heavily, which looks spectacular at first, but may lead to eyestrain over time. Better find your own settings, which is much easier now thanks to the new OSD.
- HUD (head up display) bugs

### OpenGL

OpenGL was already good in earlier versions of the ASUS drivers. In OpenGL there is no histogram, but GL never caused as many troubles as D3D. There seems to be no need for for z-value range set-off as in D3D to get good results. ASUS still requires the user to set up special modes here, for example you have to choose 1600x1200 to get 800x600 stereo! Don't be afraid, the performance is much better than mono-1600x1200, it's just a trick to reserve video-memory for the flipping.

### Conclusion

The handling isn't as good yet, but in terms of D3D-stereo-quality ASUS now plays in the same league as ELSA. Too bad it took them so long.

**Terminology of OSD's**

| | ASUS | ELSA |
|---|---|---|
| parallax-level/eye-distance | Depth | Depth |
| virtual window/plane of zero parallax | Embossment | Monpos (monitor position) |
| z-value 0 plus x set-off | Foreground | Z-front |
| z-value 1 minus x set-off | Background | Z-back |
| automatic z-value set-off | not available | Dyna-Z |
| stereo reverse. | Direction | not available |
| image error disguise on the left and right boarder of the screen | blind | not available !? (automatic) |

**INTERNET ARCHIVE**

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Searched for **http://www.stereo3d.com/revelator.htm**

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| | | | | Jan 22, 2000 * | Mar 06, 2001 | Feb 02, 2002 | Jun 04, 2003 | |
| | | | | Mar 11, 2000 | Jul 10, 2001 | Jun 06, 2002 | Jul 01, 2003 | |
| | | | | Jun 17, 2000 | Oct 31, 2001 | | | |
| | | | | Oct 14, 2000 | Dec 08, 2001 * | | | |
| | | | | Nov 02, 2000 | | | | |
| | | | | Nov 17, 2000 | | | | |
| | | | | Dec 01, 2000 | | | | |

Home | Help

# The unofficial ELSA 3D Revelator page



## Quick info:

The Revelator comes in two versions: wired and wireless. LCD-panels, connectors, drivers & compatibility are identical. Both versions feature a VESA compliant mini-DIN-3 stereo connector.

In conjunction with an ELSA consumer graphics board or most 3rd party TNT/TNT2-board they support any Direct3D game or application in a quality unpredescented by any other system. The Revelator Direct3D drivers deliver ultra-hi-res images to each eye. There are no black interlace lines or cut-into-half resolutions. The refresh rate goes from 50 Hz to at least 140 Hz fitting any taste and monitor. The Dyna-Z logic in the driver adjusts the stereo depth dynamically throughout the gameplay. No patches, no stereo-configs required!

The software page-flipping employed by ELSA not only delivers compatibility with popular chipsets such as TNT2 combined with incredible image quality and great stereo-effects. It's also the 'Achilles Heel' of the product. Just like grandpa LCD-BIOS it's vulnerable to resource conflicts with sound-cards, joysticks and such. The Revelator needs an IRQ - and uses it!!! If there are any conflicts or other 'heavy-IRQ-users' in the system it may screw the stereo-mode.

Apart from the VESA-compliant DIN-3 connector the Revelator is a 100% proprietary system and NOT compatible to anything else.

(ELSA, H3D, eyeSCREAM, Freedom wear, i-3D and similar glasses are manufactured by Ilixco and use the same IR-transmitter code though.)

The Revelator is a leap forward in terms of quality and value-for-money. At the same time it makes several steps back from the achievements Metabyte brought us with their brilliant eyeSCREAM drivers. What we need now is a driver which combines the advantages of ELSA and Metabyte and sticks to the VESA-standard, i.e. rock-solid hardware-page-flipping and DIN-3 connectors on glasses AND boards! This is also a task for the chipset-developers. They have to comply to the VESA-stereo-standard and put the required functions in - or as my lawyer says: "If it doesn't flip you musta' quit!"

NEW: Revelator now supports TNT, TNT2 & TNT2-Ultra boards of all brands. Get the generic driver at the german ELSA page. You have to fill out the registration form.

NEW (Dec. 99): The latest beta drivers for ELSA's own TNT2-boards has native OpenGL support now.

NEW (Dec. 99): Added troubleshooting section

This review isn't intended for beginners. Please consult the Basics and FAQ pages if questions arise.

This page was innitially released on July 10, 1999
last update: Dec. 30, 1999

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| 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|------|------|------|------|------|------|------|------|------|
| 0 pages | 0 pages | 0 pages | 0 pages | 7 pages | 4 pages | 2 pages | 2 pages | 0 pages |
| | | | | Jan 22, 2000 * | Mar 06, 2001 | Feb 02, 2002 | Jun 04, 2003 | |
| | | | | Mar 11, 2000 | Jul 10, 2001 | Jun 06, 2002 | Jul 01, 2003 | |
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| | | | | Dec 01, 2000 | | | | |

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# The universal ELSA Direct3D Stereo-Driver

The whole shutterglasses-market isn't about hardware. Only beginners care about fancy design, wired vs. wireless and such. With a little experience you will realize there's only one thing that matters: DRIVERS!

To make this clear: actually there's no such thing as a 'Revelator-driver' to download or buy somewhere! The stereo-driver and the Revelator-trigger-driver are from now on an integral part of the ELSA consumer VGA-board drivers. So whoever uses such a board and new drivers has the Revelator stuff in it.
What may be irritating is the fact that you won't see the Revelator-options in the ELSA-properties after installation. The trick is to install the Revelator image viewer which is available for download from ELSA. Although the image-viewer doesn't contain any driver-logic, the installation of it sets the parameter to display the Revelator Stereo 3D options in the Display properties.

Sometimes users of various shutterglasses believe that the drivers only work as long as the glasses are installed. This was true for stone-age ISA-board systems like the 3D-Max. In newer systems like H3D, eyeSCREAM or Revelator the driver can't sense the presence of the glasses. This is important since it opens the possibility of using 3rd party glasses or even HMDs with them.

These sections will be added later:

**Game and Application Compatibility**

under construction - more comments to be added later, check the pro-con table for now

**Options & Features**

under construction - more comments to be added later, check the pro-con table for now

**Dyna-Z**

under construction - more comments to be added later, check the pro-con table for now

**IRQ & Co. - Resource Conflicts**

under construction - more comments to be added later, check the pro-con table for now

## Troubleshooting

**Problem:** Slipups/Lighting in the Flipping (on-screen and glasses)

**Cause:** Revelator is triggered actively. An IRQ is used. Therefore the system is vulnerable to resource conflicts & performance problems.

**Fix:**
- Assign an exclusive IRQ to your VGA-card in the BIOS PCI/AGP setup
- Use a low numbered (i.e. high priority) IRQ
- Try to disable as unused or less important IRQ-users
- Try to disable AGP-mode
- Try a lower resolution, refresh rate or color depth
- Disable your digital joystick, wheel, force-feedback device

**Problem:** Revelator flickers irregularly (glasses only) or monitor goes blank

**Cause:** Revelator is triggered by the DDC-pin of the VGA-output, which is also used for communication with certain monitors.

**Fix:**
- Build a VGA-to-VGA adaptor and cut off the DDC-line
- Use other monitor
- Use some other system, which is Revelator-driver-compatible, i.e. Eye3D, VR-Joy, EyeFX, 60GX-NSR, AnotherI's, etc.

**Problem:** Power supply for Revelator missing on your VGA-output (for example on ASUS-VGA-boards)

**Fix:**
- Build a VGA-to-VGA adaptor and put 5V voltage to pin 9 from external source
- Build a real VGA-pass-through controller for your Revelator - see homebrew section
- Use some other system, which is Revelator-driver-compatible, i.e. Eye3D, VR-Joy, EyeFX, 60GX-NSR, AnotherI's, etc.

# How to use other boards, glasses and even HMDs with the ELSA drivers

**Boards from other manufacturers:**

It has been shown that it's possible to turn 3rd party VGA-boards with similar hardware into ELSA-boards by flashing the ELSA-BIOS into them. (Visit stereovision.net for the details.) Thereafter the ELSA-driver and the Revelator glasses will work. Warning: You may fail! You will loose the special features of your board! You will loose guarantee! Noone will grant you support - except for the internet community.

**Does it make sense?** Well, yes if you already own a new board and don't want to switch for any reason. Otherwise I would recommend to go for an original ELSA board. That's easier and saver.

**Glasses from other manufacturers:**

What the ELSA boards and drivers deliver is pure full-frame, full-resolution page-flipping, also known as field-sequential format. There are many shutterglasses on the market which are just checking the vertical sync signal on the VGA-output to synchronize the glasses.



**ELSA-compatible systems:**

- VR-Joy
- i-Art VirtualEyes
- Tetratel EyeFX

- Another I's
- NuVision 60GX-NSR
- CyberStuff Cyber3DVisor (!?)
- 3DTV stereo driver model-3000 (among other 3DTV models)
- APEC VR97
- ASUS-glasses (?)
- homebrew VGA-PT or SD

**ELSA-incompatible systems:**

- H3D (color code missing)
- eyeSCREAM (color code missing)
- VRSurfer (requires a VGA-signal with interlace-timing. I checked it - No go!)
- all parallel and serial port systems, e.g. 3D-SPEX, Cyberboy (port not triggered by ELSA drivers)
- 3D-Max and other ISA-board systems (board not triggered by ELSA drivers)

**Does it make sense?** Well the ELSA glasses are some of the best and also some of the cheapest on the market. If you don't own any glasses yet they are the best choice for the ELSA drivers. If you're looking for some king-of-compatibility glasses which also serve other purposes than D3D-gaming you may choose something like the NuVision 60GX-NSR, VR-Joy or EyeFX as a derivate. The resulting quality of synchronization varies. If the sync isn't good you may see dark borders on the top or bottom of the screen. The Revelator itself surprisingly doesn't shine in this discipline. The 60GX works flawlessly with the ELSA board here.
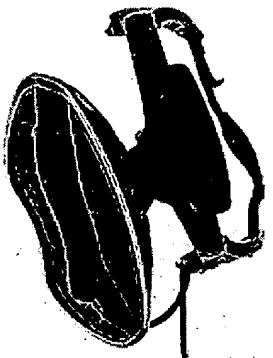
## HMDs/VR-helmets



Since the ELSA drivers deliver field-sequential stereo-format at any refresh rate it should be possible to use a compliant HMD with them.

This would require a HMD which accepts field-sequential stereo on the VGA-input. By far the most HMD don't have that option. Most consumer HMDs accept field-sequential stereo on the Video-input only. Professional HMD on the other side usually require two seperate synchronized VGA-signals. (BTW the new Matrox G400 with it's two outputs comes to mind here, but there are no stereo drivers and - usually - the two outputs of the Matrox are not synchronized. In fact Matrox is proud about the fact that they're NOT synchronized!)

One HMD which may work with the ELSA-boards and drivers in stereoscopic 3D is the Sony Glasstron LDI-D100BE. The second hottest candidate for ELSA-compatibility is the new VFX-3D, but I'm really not shure yet.

Since so many HMDs accept field-sequential stereo on the composite-video or the S-video input the second best idea would be to connect them to the TV-out of an ELSA board. Well I experimented a bit with the Erazor III to get the stereo-information out of the TV-output undamaged. I failed, but I used a very early board-version and driver, which was different from the retail-version. I also didn't invest too many time in this. There is still hope, but I wouldn't count on it. BTW I find the thought of connecting an expensive HMD and a high-quality VGA-board via a sucking PAL/NTSC compliant video-connection distgusting! It hurts image quality.

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# 3D Stereoscopic Video Display Systems Laboratory

**Carnegie Mellon**

THE ROBOTICS INSTITUTE

For a technical overview of our 3D stereoscopic display system research see:

- *Software for 3D-TV and 3D-Stereoscopic Computer Workstations*

We are working with ARPA High Definition Systems Program funding on three advanced visual display system (AVDS) issues: computers for the television set of the future, high definition flat panel display manufacturing technology, and 3D-stereoscopic display of images and graphics. My lab is the locus of the the 3D-stereoscopy program. The effort encompasses issues of encoding, transmission, compression and decompression, display hardware matched to the psychophysics of binocular perception, and also quantifying the utility of 3D-stereoscopy for rendering complex data, simulated reality, and intricate spatial relationships.

Our perception of depth via the sensation of binocular stereopsis is due to our brain's ability to compute range estimates from the two perspectives cast on our left and right retinas. If we had only one eye the depth sensation would be absent, and our perception of the world would be correspondingly ambiguous. Reproducing or synthesizing stereopsis requires reproducing or synthesizing the appropriate perspectives on two displays, one serving each eye. The two displays are generally realized by a single screen and some means of multiplexing, e.g., spatial, angular, temporal, polarization, chromatic, etc. We use temporal multiplexing when we need the highest possible spatial resolution, and we use a convenient and relatively inexpensive hybrid spatial/polarization method for less critical applications.

The niche we have chosen in the 3D-display world is the minimalist one: graft just enough technology onto the existing 2D-infrastructure to resolve crucial depth ambiguities. We contrast this with the "total immersion," "virtual reality," "volumetric display," etc, approaches, which we feel impose an unacceptable overhead on the majority of users who need only simple video imagery or spreadsheet graphics displayed in low-tech, low-cost, low-eyestrain 3D.

We are researching:

- 3D displays
- analog and digital 3D-video
- 3D-computer graphics

A novel approach to parallax panoramagrams using time multiplexing is proposed in *A Time-Multiplexed Autostereoscopic Display Based on Moving Parallax Barriers*.



Our video work is driven by its application to remote visual inspection of aircraft for cracks and corrosion. The following papers best describe our research.

- *Enhanced Remote Visual Inspection Of Aircraft Skin*
- *Remote Inspection Technologies for Aircraft Skin Inspection*
- *Image Understanding Algorithms for Remote Visual Inspection of Aircraft Surfaces*
- *Image Enhancement and Understanding for Remote Visual Inspection of Aircraft Surface*



Such a visual inpection procedure requires geometrically correct imagery. From the beginning we have, theoretically and in practice, designed stereocameras with the proper optical and sensor systems to take stereo pictures that are easy to view. An aircraft inspector might spend hours looking at our stereoimagery without eyestrain.

These papers discuss the correct camera and screen geometries for creating 3D-stereoscopic images.

- *Geometry of Binocular Imaging I: The Naked Eye*
- *Geometry of Binocular Imaging II: The Augmented Eye*
- *Geometry of Binocular Imaging III: Wide-Angle and Fish-Eye Lenses*

Our graphics work is guided by its application to the visualization of graphical representations of complex multi-dimensional data interactively aggregated from large databases. We initially worked with the Sage Group on the graphical portion of their project.



The current focus is sensor fusion and corresponding 3-D display of ultrasound, MRI, and CT data as exemplified in

- *Measurement Issues in Quantitative Ultrasonic Imaging*
- *Frameless Patient Registration Using Ultrasonic Imaging*



Within an HDTV infrastructure, it is possible to create high-definition stereoscopic imagery, using one high-resolution color camera and two low-resolution monochrome cameras, as described in *Synthesis of a High Resolution 3D-Stereoscopic Image from a High Resolution Monoscopic Image and a Low Resolution Depth Map.*

Piggy-backing 3D on the existing 2D-infrastructure of TV recording, broadcast, and display is only marginally possible. The infrastructure is capable of transporting some fixed number of pixels * colors * gray levels per second; dividing this bandwidth by two to make it serve two eyes extracts an unacceptable price in image quality per eye. HDTV will help, but the effect of a naive implementation will still be to drop back to something like NTSC resolution per eye.

A more sophisticated implementation would take advantage of the high correlation between left and right perspectives to achieve compression based on left-right predictability, in the same way that video compression schemes like MPEG exploit the temporal correlation between

previous and future times. Using these concepts, we have succeeded in encoding stereo image streams in only a few percent more bandwidth than is needed to encode either image stream alone.

Since these compression schemes are based on left-right predictability, we can use very similar algorithms to synthesize intermediate views, adding the illusion of "look around" to 3D stereoscopic imagery in which in fact only two perspectives are actually present.

This research is sponsored in part by Advanced Research Projects Agency Electronic Systems Technology Office High Definition Systems Program Grant MDA972-92-J-1010.

## Project Related Companies & Organizations

- Advanced Television Systems Committee
- Canare Corporation of America
- International Stereoscopic Union
- National Stereoscopic Association
- Orign Instruments Corporation
- Panasonic Broadcast & Digital Systems
- Samsung Aerospace Industries, Ltd., Opto - Imaging System & Instruments Division
- Silicon Graphics
- SMPTE
- SPIE
- StereoGraphics
- VRex

We have been archiving stereo image sequences from various sites on the net.

## Our AVDS Publications

## Related Newsgroups

- <u>alt.3d</u> - 3D discussion newsgroup
- <u>comp.compression.research</u> - research issues in audio and video compression
- <u>comp.graphics.animation</u> - computer animation discussion group
- <u>comp.graphics.opengl</u> - opengl graphics protocol discussion group
- <u>comp.multimedia</u> - discussions about computer multimedia applications and technologies
- <u>comp.sys.sgi.graphics</u> - silicon graphics graphics discussion group
- <u>sci.image.processing</u> - scientific discussion of image processing
- <u>sci.optics</u> - scientific discussion of optics and optical systems

## Our People

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Here's a summary (and history) of our other research areas.

contact person: Mel Siegel, mws@cmu.edu

Mel Siegel's homepage
Intelligent Measurement and Control Lab (a.k.a. *The Sensor Lab*) homepage
The Robotics Institute homepage
School of Computer Science homepage
Carnegie Mellon University homepage

maintained by: Alan Guisewite, adg@cmu.edu

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- The Icon Bank for the PDF and PS icons!

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| | | | | | | Aug 09, 2002 | | |
| | | | | | | Dec 02, 2002 * | | |

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### NVIDIA.

## NVidia stereoscopic driver officially released

NVidia decided to put stereo-capabilities to their reference drivers. This has several positive effects. From now on every new driver release will support stereo. We won't have to wait until ELSA, Wicked3D or ASUS catch up with their own drivers. More and more board-manufacturers will start to distribute 3d-glasses. I guess there will be no new versions of ELSA's own driver in the old form and the future of ASUS' own driver is questionable.

NVidia based boards were already the best choice for gaming and amateur level stereo applications. With the new reference drivers the gap between NVidia and it's competitors gets even wider. If you're interested in 3d-glasses and stereo-gaming a NVidia-based VGA-board is the only logical choice. There are game-drivers for other VGA-chipsets, i.e. VRCaddy and Wicked3D, but they don't match the NVidia reference driver (or ELSA's, or ASUS' own NVidia drivers) in terms of compatibility, quality, stability, topicality and ease of use.

The NVidia stereo-driver is available for Windows 9x/ME only, not for WindowsNT/2000 of course!

## Download

At the download site you'll find 4 files you'll need:

- the latest NVidia reference graphics driver
- the latest NVidia reference stereoscopic driver
- a document about the basics of stereoscopy and the stereo driver (tech brief)
- a huge manual for the driver

Even if you don't own an NVidia board and/or 3d-glasses yet I'd recommend you to download the manuals. Contains lots of basic information.

## Facts on the upside:

- Very good stereo quality
- Very good game compatibility and stability
- Unusully good documentation

- Gigantic, almost perfectly complete game settings library for virtually all demos and full versions ever released
- Medical and graphics mode tests
- Laser Sight stereoscopic aiming
- JPS full res stereo image viewer with slide-show function
- Configurable hotkeys

## Facts on the downside:

- OSD not (yet) implemented
- Uses ELSA Revelator driver technology at it's core. Still causes problems with certain monitors, 3D-sound drivers and digital input devices on the game-port. This may very well be the fault of the likes of Microsoft and Creative Labs, not necessarily the stereo-driver developers. Someone doesn't play the rules of fair IRQ-usage.
- Some hotkeys show very slow reaction

**WARNING for ASUS users:** If you use the NVidia reference stereo driver as is with ASUS-3D-glasses you will experience inversed-stereo in many cases. You must use StereoViewerType=2 settings in the registry (see instructions below)! Don't use the ASUS glasses upgrade kit with 3rd party NVidia-boards, since you won't have a chance to control the stereo-orientation.
By the way, I'm using an ASUS V6600 board with GeForce256 (i.e. GeForce1) chipset. The ASUS mode (StereoViewerType=2) is buggy on my machine, but should work on most other configurations. If you use an ASUS board you may give some feedback at the underlined webboard.

## 3D-glasses and board selection:

- Start the Windows Registry editor at c:\windows\regedit.exe
- Choose: HKEY_LOCAL_MACHINE --> Software --> NVidia Corp --> Global --> Stereo3D
- Right-click on 'StereoViewerType', choose 'modify', enter digit 1, 2, 4 or 10 as described below, set radio button to 'hexadecimal'

## StereoViewerType settings in Registry:

**1** - standard setting, software page-flipping, ELSA-Revelator DDC-trigger
**2** - for ASUS boards, hardware page-flipping with interlace-like time gap between frames, no Revelator-trigger
**4** - software page-flipping, no Revelator-trigger
**10** - software page-flipping, blue-line code for new CrystalEyes and StereoEyes
**10 & "LineCodeColor"=dword:00FFFFFF** - software page-flipping, white-line-code for StereoGraphics SimulEyes,

CrystalEyes-EPC2 and miro Fanatix (to achieve this right-click into the registry window where the StereoViewer option is located, choose New --> DWORD, type LineCodeColor, value 00FFFFFF, set radio button to hex)

You'll see that the little picture of the 3D-glasses shown in the graphics properties will change accordingly

**VGA-board compatibility:**

all NVidia based boards with chipsets from the TNT-, GeForce- or Quadro-familiy

**3D-glasses compatibility:**

**Glasses which are fully supported with automatic stereo-orientation and automatic on/off:**
ELSA Revelator, i-glasses-H3D-Cruiser, i-glasses-H3D-'new universal model', latest Cybervision models

**Glasses which are fully supported with automatic stereo-orientation:** ASUS VR100 glasses (use StereoViewerType=2), miro 3D-fanatix, StereoGraphics SimulEyes, CrystalEyes2 with EPC-controller, CrystalEyes3, StereoEyes (use StereoViewerType=10 )

**Glasses supported with manual stereo-orientation (make shure you choose the right stereo-orientation, choose StereoViewerType=2 for ASUS-boards, choose standard setting StereoViewerType=1 for all other boards):**
All i-Art glasses models (except Eye3D-PCI), all VRStandard VR-Joy models, all AnotherWorld models, all CyberVision models, all Tetratel models, all APEC-models with VGA-interface, NuVision 60GX-NSR, (VRex VRSurfer only supported on ASUS-boards, change Registry to StereoViewerType=2 )

**Glasses which are not (fully) supported:**
i-Art Eye3D PCI: You can activate the Eye3D-PCI using the Eye3D-Activator, but within a game you usually can't use the hotkey for stereo-reverse. The NVidia driver has no reverse hotkey so your only chance may be to use the 3D-on/off hotkey until you get the right stereo-orientation by chance

Glasses with serial or parallel port interface (i.e. 3D-Spex, Cyberboy, etc.): the driver doesn't send a trigger signal to the serial or parallel port. You may try to get it work using the WINx3D driver or build a homebrew VGA-interface for your glasses.

Classic H3D/Wicked3D glasses: almost no chance to get it working, even with H3D-Activator, just lots of problems.

For discussing the new driver please join the following webboards:

stereo3d.com Discussion
Stereovision.net Forum

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Searched for **http://www.stereovision.net/legrandduc/e3fix.htm**    **6** Results

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| 0 pages | 0 pages | 0 pages | 0 pages | 0 pages | 2 pages<br>Jun 04, 2001 *<br>Aug 27, 2001 | 2 pages<br>Oct 21, 2002<br>Dec 19, 2002 | 2 pages<br>Feb 20, 2003<br>Apr 25, 2003 | 0 pages |

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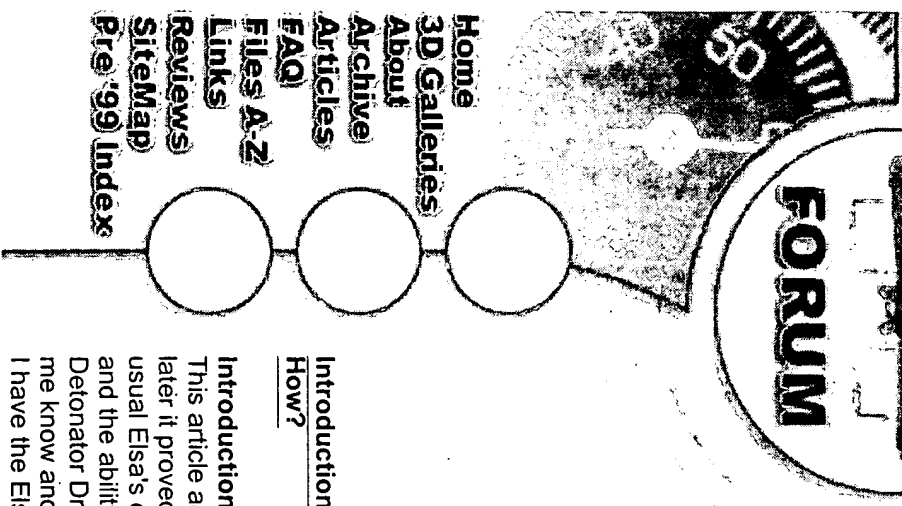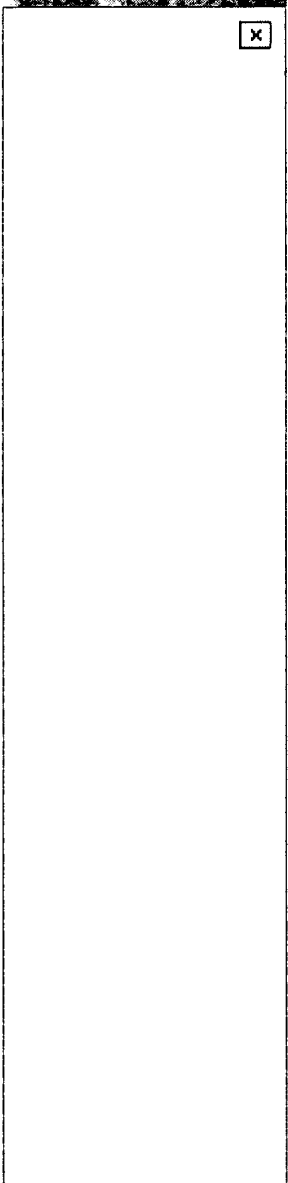
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FORUM

Introduction
How?

# Installing Generic Drivers on Elsa's Cards
## Using GenFix patch
by LeGrandDuc

**Introduction**

This article and the patch I've made was at the beginning aimed only at ErazorIII users with Vivo ( Video In/Out ) support, but later it proved to be usefull to all Elsa cards owners who try to get the best from their revelator. What this patch adds over the usual Elsa's drivers is better OpenGL support, some additional features for the older cards such as ingame gamma control, and the ability to switch between two drivers such as the Generic Driver and the one that supports ViVo or the latest Detonator Driver from Nvidia. Currently after 4 updates the patch supports nearly all Elsa's cards. If I missed one or more let me know and I'll try to add them for you. Now let me explain how this all started:
I have the Elsa Erazor III PRO VIVO card which I use for Video in/Video out as well as for gaming and stereoscopy with the

3D Revelator LCD Glasses.
Elsa offers two versions of drivers for the Erazor III card series:

- the one based on 3.69 drivers with included ViVO support,
- the other is based on 5.30 drivers thus more compatible to newest games (including Diablo 2), faster in some cases and has more stereo support options, but has no ViVO Support.

As I want to use the best aspects of both the drivers I looked and found solution to run them both.

Notice:
If you don't want the ViVO support but want to use the newest Reference drivers from _NVIDIA_ instead, you can do it by installing Reference drivers in step "1." instead of the 3.69 driver.
You can skip step 1 if you want just one driver on your system.

**How?**
You have to download two drivers:

- 3.69 driver for the Erazor III series
- Generic 3D Revelator Driver based on 5.30 and the 3D screenshots viewer

You will find both _drivers_ here at the Elsa driver download area. If you prefer your local Elsa site, _jump to Elsa_ and click your way through to the driver download.
In addition download _this zip file_ which is called Genfix4 and includes the needed patches to the driver. Before installing new drivers uninstall the old one and clean up the system and the Registry by installing a standard VGA graphics card and rebooting.

1. Install the 3.69 Driver as you usually would (restart needed when prompted). Don't forget to install Stereo screenshots viewer if you have the 3D Revelator.
2. Right click on the generic driver executable installation file and choose "extract to" and then c:\tempdrv After extraction is complete you will have in the tempdrv directory the files of the generic driver.
3. Unzip the _Genfix4.zip_ file to the c:\tempdrv directory overwriting existing files.
4. Run the Package.exe exacutable in c:\tempdrv
5. When prompted tell the installation to save old driver configuration as well as the new configuration.
6. Now you'll have the option to use the newly installed Revelator Suite (look for it in the Start menu) to switch between the two drivers (in my case 3.69 for ViVo and 5.30 for games).

I hope that you will find this information useful. If you do, please let me know by _emailing me here_.

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# StereoGraphics Corporation
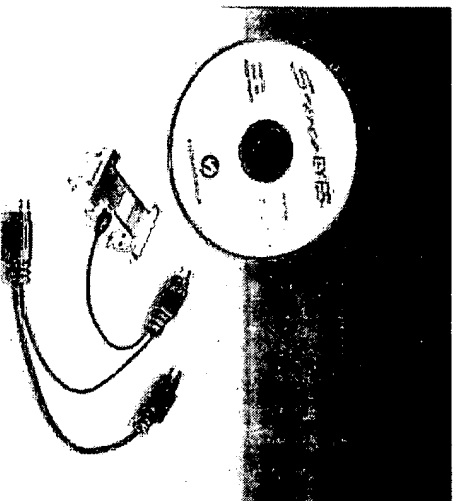
## StereoEnabler™

## Get True Stereo3D™ on Windows with the StereoEnabler™!

Overview | Features & Benefits | Specifications | Product Q&A | Pricing | Contact

Bring Your Models to Life with the StereoEnabler!

If you are a chemist or biologist studying molecular structures, a GIS professional involved in analysis of 3D geographic data, a design engineer working with analysis software, an architect using 3D modeling, or a software developer adding real-depth perception to your software, and you want to use any desktop PC where the graphics card driver supports stereo, but there is no stereo connector, you need the StereoEnabler. Accurate interpretation of 3D information is critical to getting your projects understood and approved faster. StereoEnabler, the newest Stereo3D visualization product from StereoGraphics, brings you the toolkit you need to add stereoscopic true depth visualization to your PC. Now you can clearly review designs, simplify complex analysis, validate molecular structures or

interpret spatial analysis faster and better than ever before. Collaborate with colleagues, find errors faster, finish projects sooner - all on your desktop.

## Product Overview

The StereoEnabler permits stereoscopic viewing of stereo-enabled software on graphics cards that do not normally support stereo on Windows platform.

The StereoEnabler connector works in conjunction with all StereoGraphics Stereo3D products -- CrystalEyes 3 and Monitor ZScreen 2000 Series. The StereoEnabler is an intelligent pass-through VGA connector for the monitor and outputs the stereo sync signal to an infrared emitter or ZScreen controller via a 3-pin mini-DIN plug. The sync signal is transmitted to the StereoEnabler by coding the bottom raster line of the video signal (blue-line code) and the intelligent controller generates the pulse signal from this video signal. Additional power required by the emitter is achieved by plugging in the PS/2 connector on the StereoEnabler into the keyboard PS/2 connector on the PC. The emitter or controller interprets the sync signal to shutter the eyewear or ZScreen to separate the left and right eye images, giving the user the ability to view in stereo.

## Key Benefits

- Enables realistic visualization on Windows with almost any graphics card
- Accelerates understanding of complex structures and data on Windows
- Facilitates interpretation of spatial data

## Key Features

- **Easy Installation** - StereoEnabler connects right into your monitor and Stereo3D viewing device.
- **VESA Standard Connector** - StereoEnabler's 3-pin connector is based on standards established by VESA (Video Electronics Standards Association). This ensures compatibility with all VESA-compliant, stereo-ready graphics cards.

Stereo3D is the use of technology to re-create the way we naturally see depth: stereoscopically.

Stereoscopic viewing describes how we use both eyes - each with a slightly different perspective - to perceive depth in a physical environment.

## Specifications

### StereoEnabler:

- 15 pin analog VGA pass-through connector
- VESA 3-pin mini-DIN for stereo sync signal
- PS/2 keyboard pass-through connector(for power)
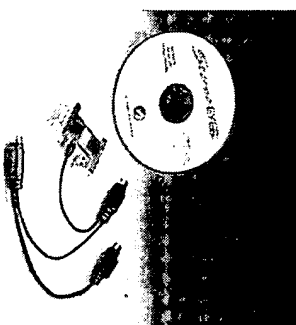
*StereoEnabler*

## Product

StereoEnabler system (Includes SVGA Connector)

## Pricing

**MSRP**
**(US$)** **Buy Online**

$89.00       **Qty:** [ 1 ]

[ Add to Cart ]

## Contact

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**STEREOGRAPHICS**

# CHRISTIE

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**Christie 3D Cinema Server**

38-804655-01

## Solutions For

- Simulation
- Immersive environments
- Virtual Reality
- 3D computer-aided design
- VisSim

## Product Info
Introduction
Specifications
Images
Brochures

## Resources
Service & Support
Try It / Buy It
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White Papers
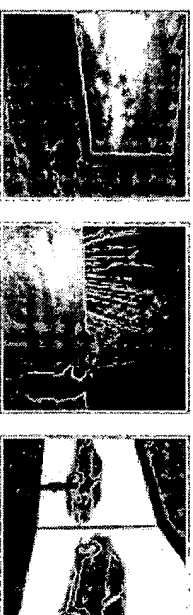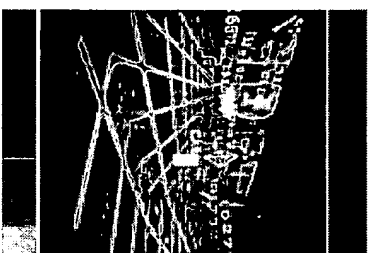
# The world's first digital 3D Cinema™ solution

Christie's 3D Cinema™ Server, together with a 3D 3-chip DLP™ Mirage projector, displays digital 3D movies - providing the world's first stereoscopic digital 3D entertainment movie system.

This 3D entertainment solution delivers stunning 3D high definition content from a single server and a single projector and it is ideally suited for theme and amusement parks, attractions, alternative content in specialty theaters, 3D cinemas, auditoriums and museums. Users benefit from a significant cost savings: only one stereoscopic projection system is used to combine both lefteye and righteye content. The server, together with a single Mirage projector, can show 3D movies in either passive stereo projection with a passive eyewear system for cost effective quality stereo for large audiences or active stereo with active LC shutter eyewear for the best possible stereo.

When used with any of the Mirage series 3-chip DLP™ projectors, this single 3D playback system provides a maintenance-friendly solution for stereoscopic image display. Utilizing a Sun®Blade® 2000 workstation as its base device, the 3D Cinema™ Server incorporates specialized software that takes advantage of the Sun StorEdge™ MultiPack Fiber Channel disk array architecture to deliver high definition and high quality stereoscopic images to the projector. The system can be upgraded with standard Sun peripherals and supports all software supported by Sun Solaris™.

The high-definition movie content is uncompressed ensuring the best possible image display with no artifacts, especially between left and right eyes, as can be found with standard video compression such

as MPEG or AVI. Digital format videos are imported and reformatted for the server through a built-in video import utility. By taking advantage of a graphics accelerator, which supports quad-buffered stereo output, the stereoscopic image is output through a single video channel to the projector. The single page-flipping stereo video output outputs frame-sequential stereo for best quality stereo viewing: it's optimized for Christie's Mirage projectors capable of supporting high stereo refresh rates.

Fast and easy to setup - there's no balancing color, contrast, brightness or alignment of dual film projector systems, no handling of film reels which directly translates into much lower maintenance costs with this fully digital 3D solution. An intuitive user interface makes it very easy to play back movies stored on digital server. Operation and demonstration of the movie player is reliable and user-friendly. High reliability of a robust server hardware and projector allow thousands of hours of trouble-free use. Content security isn't an issue - the content is securely stored within the server.

Excite audiences with 3D digital movie projection - from Christie.

**Recreate Reality...with ease.**

## Features

- Industry proven computing and graphics hardware technology offering high system reliability and graphics performance
- Intuitive graphical user interface allows simple movie load procedure and simple controls for movie playback
- Supports stereo movies at up to SXGA resolution - 1280 x 1024 x 96Hz (24 x 2 x 2fps) or up to XGA resolution - 1024 x 768 x 120Hz (30 x 2 x 2fps)
- Sun StorEdge™ disk arrays allow up to 45 minutes of uncompressed 24fps at 1280x720 resolution movies to be stored on the disks
- Single-page flipping (frame sequential) stereo output
- Stereo viewing supported by active and passive eyewear
- High quality movie source
- High brightness and flicker-free stereo projection
- Supports non-stereo movies

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Best viewed with Internet Explorer 5.5 or higher @ 800x600

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Searched for **http://www.christiedigital.com/Products/products.asp?Port=4&ProdPartNo=38-804655-01**    **5** Results

* denotes when site was updated.

## Search Results for Jan 01, 1996 - Mar 26, 2004

| 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
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| 0 pages | 0 pages | 0 pages | 0 pages | 0 pages | 0 pages | 3 pages | 2 pages | 0 pages |
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| | | | | | | Oct 22, 2002 * | Jun 27, 2003 * | |
| | | | | | | Dec 24, 2002 * | | |

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Set      Items   Description
S1          77   PSEUDODRIVER? ? OR PSEUDO(3W)DRIVER? ? OR PSDD
S2        1347   SOFTWARE()DRIVER? ? OR PSEUDO()(ROUTER? ? OR REROUT??? OR -
                 DIRECT??? OR REDIRECT???) OR VIRTUAL()(DRIVER? ? OR ROUTER? ?)
                 OR PSEUDO()(API OR APPLICATION()PROGRAMMING()INTERFACE? ?)
S3         321   MULTIPLEX????(3N)SOFTWARE? ? OR (MUXDEMUX OR MUX()DEMUX)(3-
                 N)(DRIVER? ? OR SOFTWARE? ?) OR (MULTIPLEX?????(2N)DEMULTIPLE-
                 X?????)(3N)(DRIVER? ? OR SOFTWARE? ?)
S4           3   (NVIDIA OR ASUS OR ELSA)(3W)DRIVER? ?
S5      176770   3()D OR 3D OR 3DIMENSION???? OR 3()DIMENSION???? OR THREE(-
                 )D OR THREED OR THREE()DIMENSION???? OR THREEDIMENSION????
S6        4843   STEREO()SCOP????? OR STEREOSCOP????? OR (STEREO OR TANDEM -
                 OR DUAL)()(VISION OR VIEW???? OR GRAPHIC????? OR IMAG????) OR
                 STEREOPSIS???? OR STEREOPTIC????? OR STEREO()OPTIC????? OR ST-
                 EREOVISION???
S7           1   STEREO3D OR 3DSTEREO
S8       18752   LEFT(3N)(OUTPUT???? OR SIGNAL???? OR IMAGE()DATA OR VIEW? -
                 ?)
S9       19941   RIGHT(3N)(OUTPUT???? OR SIGNAL???? OR IMAGE()DATA OR VIEW?
                 ?)
S10      28697   GAME? ? OR VIDEOGAME? ? OR VIRTUAL()REALITY OR VIRTUAL3D OR
                 CYBERGAME? ? OR GOGGLES OR CYBERGOGGLES OR CYBERHELMET?? OR -
                 (HEAD()MOUNTED OR HEADMOUNTED)(2N)(DISPLAY??? OR DEVICE? ? OR
                 HELMET? ?)
S11     769443   CONVERT??? OR CONVERS???? OR TRANSLAT???? OR INTERCEPT?????
S12      34446   (MULTI OR MULTIPLE OR SEPARATE OR PLURAL OR PLURALITY OR A-
                 DDITIONAL OR NUMEROUS OR SEVERAL OR MANIFOLD)()(IMAGE??? OR V-
                 IEW? ? OR DISPLAY? ?)
S13      54996   IC=H04N?
S14          0   1:S4 AND S5 AND S6
S15          0   S1:S4 AND S7
S16       2742   S5 AND S6
S17       2742   S16 OR S7
S18        688   S17 AND S10
S19        663   S17 AND S13
S20       1148   S18:S19
S21        300   S20 AND S8 AND S9
S22        416   S20 AND S12
S23        121   S21 AND S22
S24         85   S23 AND S13
S25         33   S1:S4 AND S5 AND S6
S26         33   S25 AND S16:S24
S27         33   S25:S26
S28         33   S27 AND S8:S13
S29          4   S4 OR S7
S30         35   S29 OR S28
S31         35   IDPAT (sorted in duplicate/non-duplicate order)
? SHOW FILES
File 348:EUROPEAN PATENTS 1978-2004/Mar W02
         (c) 2004 European Patent Office
File 349:PCT FULLTEXT 1979-2002/UB=20040318,UT=20040311
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?
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**31/3,K/7**      **(Item 7 from file: 349)**
DIALOG(R)File 349:PCT FULLTEXT
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01009962      **Image available**
**VIRTUAL REALITY GAME SYSTEM WITH PSEUDO 3D DISPLAY DRIVER & MISSION CONTROL**
**SYSTEME DE JEU DE REALITE VIRTUELLE COMPORTANT DES PSEUDO-COMMANDES**
    **D'AFFICHAGE 3D ET UNE COMMANDE DE MISSION**
Patent Applicant/Assignee:
  ATLANTIS CYBERSPACE INC, Bldg. 12, 874 Dillingham Blvd., Honolulu, HI
    96817-4598, US, US (Residence), US (Nationality)
Inventor(s):
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  BOUTELIER Cedric, Atlantis Cyberspace, Inc., Bldg. 12, 874 Dillingham
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Legal Representative:
  CHONG Leighton K (agent), Ostrager Chong & Flaherty (Hawaii), Suite 1200,
    841 Bishop Street, Honolulu, HI 96813-3908, US,
Patent and Priority Information (Country, Number, Date):
  Patent:              WO 200339698 A1 20030515 (WO 0339698)
  Application:         WO 2002US35238 20021031  (PCT/WO US0235238)
  Priority Application: US 200111023 20011102; US 200111027 20011102
Designated States: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU
  CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP
  KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO
  RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG UZ VN YU ZA ZM ZW
  (EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LU MC NL PT SE SK TR
  (OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
  (AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
  (EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 11971

Fulltext Availability:
  Detailed Description
  Claims

Detailed Description
...  as nVidia Corp., of Santa Clara, CA, have recently provided support
  for single-signal, stereo **vision** formats. For example, the nVidia
  stereo **vision** **drivers** are contained within the **nVidia** video
  card-specific **driver** , nvdisp.drv. The **nVidia** **driver** effectively
  **converts** a 3D **game** written for DirectX or OpenGL to be viewable in
  stereo **vision** using any single-signal **3D** device that is  ...
  Conventional hardware manufacturers do not support card-independent
  high-end, separate right and left image **signals** .

  Another important aspect of the invention is the **interception** of the
  data stream at the **game** -API level. Conventional **stereovision** drivers
  are established between the API and the video card, and the code existing
  between a drawback in a **game** system that offers many different. **games**
  using the same video card hardware. Another drawback is that the data has
  already undergone a **3D** **game** data to 2D image data transformation, and
  is therefore fixed as 2D.

31/3,K/19     (Item 19 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00902464     **Image available**
**VIRTUAL REALITY GAME SYSTEM WITH PSEUDO 3D DISPLAY DRIVER AND MISSION CONTROL**
**SYSTEME VIRTUEL DE JEU SIMULANT LA REALITE, COMPRENANT UN PSEUDO PILOTE D'AFFICHAGE TRIDIMENSIONNEL ET UN CENTRE DE COMMANDE**
Patent Applicant/Assignee:
  ATLANTIS CYBERSPACE INC, Bldg. 12, 874 Dillingham Blvd., Honolulu, HI
    96817-4598, US, US (Residence), US (Nationality)
Inventor(s):
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    Blvd., Honolulu, HI 96817-4598, US,
  BOUBEKER Cedric, c/o Atlantis Cyberspace, Inc., Bldg. 12, 874 Dillingham
    Blvd., Honolulu, HI 96817-4598, US,
Legal Representative:
  CHONG Leighton K (agent), Ostrager Chong & Flaherty (Hawaii), Ste. 1200,
    841 Bishop Street, Honolulu, HI 96813-3908, US,
Patent and Priority Information (Country, Number, Date):
  Patent:              WO 200236225 A1 20020510 (WO 0236225)
  Application:         WO 2001US46939 20011102  (PCT/WO US0146939)
  Priority Application: US 2000244795 20001102; US 2000244796 20001102
Designated States: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU
  CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP
  KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO
  RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
  (EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
  (OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
  (AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW
  (EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 11851

Fulltext Availability:
  Detailed Description
  Claims

Detailed Description
... a single signal.

  Because of this compression, and overloading of a single signal, the
  stereo **vision** image quality is lowered, and/or the frame rate is
  lowered. The lower quality, "single signal" methods are typically used by
  lower-priced **stereovision** hardware, like LCD glasses. Some hardware
  vendors, such as nVidia Corp., of Santa Clara, CA, have recently provided
  support for single-signal, stereo **vision** formats. For example, the
  nVidia stereo **vision** **drivers** are contained within the **nVidia** video
  card-specific **driver** , nvdisp.drv. The **nVidia** **driver** effectively
  **converts** a **3D** **game** written for DirectX or OpenGL to be viewable in
  stereo **vision** using any single-signal **3D** device that is connected to
  the nVidia video card. However, these card-specific drivers only...

  ...Conventional hardware manufacturers do not support card-independent
  high-end, separate right and left image **signals** .

  Another important aspect of the invention is the **interception** of the

data stream at the **game** -API level. Conventional **stereovision** drivers are established between the API and the video card, and the code existing between...

...made by the manufacturer of the video card hardware, which is a drawback in a **game** system that offers many different **games** using the same video card hardware. Another drawback is that the data has already undergone a **3D** **game** data to 2D image data transformation, and is therefore fixed as 2D.
Once the data are **converted** to 2D, the 2D data can be **converted** to **stereovision** only with "less visually accurate" mathematics.

In the preferred embodiment of the invention, two separate video cards 22 and 24 are used for - 9 the separate right and left signal inputs of high-end **3D** display devices. Doubling the number of video cards allows for the right and left stereo **image** to be rendered separately and simultaneously. This avoids the typical 2x slowdown required to display stereo rather than mono. The **Pseudo** **Driver** thus allows a normal **3D** **game** to power two video cards, which in turn can power high-end **3D** display hardware such as V6 or V8 (TM) **Stereovision** **Head** Mounted **Displays** , distributed by Virtual Research Systems, Inc., of Santa Clara, CA, Visette (TM) **Stereovision** **Head** Mounted **Display** , distributed by Cyber Mind, Ltd., of Leicestershire, UK, Datavisor (TM) **Stereovision** Head Mounted **Display** , distributed by N-Vision, Inc., of McLean, VA, or DTI 2015XLS or 2018XLQ (TM) **Stereovision** Monitor, distributed by Dimension Technologies, Inc.
Pseudo **3D** Display **Drivers**
In the present invention, the **3D** **game** data output of existing **game** software are **intercepted** and re-directed to **Pseudo** **Drivers** for **3D** display in place of the conventional AP] drivers for 2D display. The **Pseudo** **Drivers** execute the same or comparable image rendering functions but generate the specific right 5 and left image viewpoints required by **3D** display devices. The **Pseudo** **Drivers** only **convert** the **3D** **game** output of the **game** software and do not affect or manipulate the **game** software itself. Thus, the **Pseudo** **Drivers** can produce a **3D** display from conventional **3D** **game** software without requiring access to or modification of the **game** source code.

00402937     **Image available**
**STEREOSCOPIC 3-D VIEWING SYSTEM WITH PORTABLE ELECTRO-OPTICAL VIEWING GLASSES**
**EQUIPEMENT DE VISUALISATION STEREOSCOPIQUE EN TROIS DIMENSIONS A VERRES DE VUE ELECTRO-OPTIQUES**
Patent Applicant/Assignee:
  VREX INC,
  LAZZARO Garard M,
  SWIFT David C,
  HAMLIN Gregory J,
  FARIS Sadeg M,
Inventor(s):
  LAZZARO Garard M,
  SWIFT David C,
  HAMLIN Gregory J,
  FARIS Sadeg M,

*US 5821989*

Patent and Priority Information (Country, Number, Date):
  Patent:              WO 9743681 A1 19971120
  Application:         WO 97US8028 19970513  (PCT/WO US9708028)
  Priority Application: US 96648215 19960515
Designated States: AL AM AT AU AZ BB BG BR BY CA CH CN CZ DE DK EE ES FI GB
  GE HU IS JP KE KG KP KR KZ LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL
  PT RO RU SD SE SG SI SK TJ TM TR TT UA UG US UZ VN GH KE LS MW SD SZ UG
  AM AZ BY KG KZ MD RU TJ TM AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL
  PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG
Publication Language: English
Fulltext Word Count: 13386

International Patent Class:  **H04N-13:04** ...

... **H04N-15:00**
Fulltext Availability:
  Detailed Description
  Claims

Detailed Description
...  graphics
  system by way of a split connector (Le. Dongle), with the wireless
  stereoscopic 3- **D**  glasses being operably connected, in a wireless
  manner,
  14
  to the shutter-state control signal...
...Fig. 2B is a block schematic system diagram of a second
  illustrative embodiment of the **stereoscopic** 3- **D**  image viewing system
  of the present invention, wherein the video input of the shutter-state...

...port of the CRT-based
  1 0 television set or video monitor, with the wireless **stereoscopic** 3-
  **D**
  glasses being operably connected to the shutter-state control signal
  transmitter in a wireless manner...

...Fig. 2C is a block schematic system diagram of a second illustrative

embodiment of the **stereoscopic** 3- **D** image viewing system of the
1 5 present invention, wherein the video input of the...or video monitor
by way of a split connector (i.e.

dongle), with the wireless **stereoscopic** 3- **D** glasses being operably
connected to the shutter-state control signal transmitter in a wireless
manner...

...embodiment of the present invention;
Fig. 4 is a schematic block diagram of the wireless **stereoscopic** 3- **D**
glasses of the present invention, showing the various electronic and
opto-electronic components embedded within...

...a schematic representation of (i) the vertical
synchronization pulse signal associated with a standard 3- **D** VGA/SVGA
interlaced (i.e. interleaved) formatted video signal produced from a
standard VGA/SVGA...

...computer system or workstation,
(ii) the horizontal synchronization pulse signal associated with the
standard 3- **D** VGA/SVGA interlaced format video signal produced
therefrom, (iii) the horizontal synchronization signal pulse count...
image to be displayed on the CRT display;
Fig. 6A is schematic diagram of the **stereoscopic** 3- **D** viewing
glasses of the present invention, shown being operated in its
electrically
passive mode (i...

...polarization state P2, orthogonal to PI;
1 0 Fig. 6B is schematic diagram of the **stereoscopic** 3- **D** viewing
glasses of the present invention, showing being operated in its
electrically-active mode (i.e. battery-power ON), where during a first 2
D image display period the **stereoscopic** viewing glasses receive
infrared
(pulse-train encoded) shutter-state control signals from the shutter1 5
...

...an optically opaque state, and then during a
second 2-D image display period the **stereoscopic** viewing glasses
receive infrared ("pseudo" pulse-train encoded) shutter-state control
signals from the shutter...

...eye viewing shutters into an optically transparent
state;
Fig. 6C is schematic diagram of the **stereoscopic** 3- **D** viewing
glasses of the present invention, showing being operated in its
electrically-active mode (i.e. battery-power ON), where during a left
image display period the **stereoscopic** viewing glasses receive infrared
L-pulse-train encoded shutter-state control signals from the shutter...
shutter into an optically opaque state, and then during a right image
display period the **stereoscopic** viewing glasses receive infrared
(Rpulse-train encoded) shutter-state control signals from the
shutter-state...

...an
optically transparent state;
Fig. 7 is a schematic representation of another embodiment of the

stereoscopic  3- D  image viewing system of the present invention, based
on the spatially-multiplexed image (SMI) display format, in which the
1 0  **stereoscopic**  3- D  shutter glasses of the present invention are
operated in their electrically-passive (transmissive or clear) state, for
**stereoscopic**
viewing of 3- D  images represented in linearly-micropolarized polarized
SMIs displayed from an LCD panel;
Fig. 8 is a schematic representation of another embodiment of the
1 5  **stereoscopic**   **3D**  imaging viewing system of the present invention
in
which hardware line blanking (possibly in the form of a dongle) is used
to covert the non-interlaced, line-alternate  **stereoscopic**  image to a
alternate page-flipped right and left  **views** ;
Fig. 9 is a schematic representation of another embodiment of the
 **stereoscopic**   **3D**  imaging viewing system of the present invention in
which hardware color signal blanking (possibly in the form of a dongle)
is used to covert the non-interlaced, line-alternate  **stereoscopic**  image
to
a alternate page-flipped spectrally multiplexed right and left  **views** ;
Fig. IOA is a schematic representation of another embodiment of
the  **stereoscopic**   **3D**  imaging viewing system of the present invention
implementating a full color analgyph  **conversion** , in which color signal
blanking and summing hardware (possibly in the form of a dongle) is
used to  **coNvert**  the non-interlaced, line-alternate  **stereoscopic**  image
to
1 9
an anaglyph  **stereoscopic**  image format;
Fig. IOB is a chart showing the various forms of anaglyph which
can...

...and Fig. 11; and
Fig. 11 is a schematic representation of another embodiment of
the  **stereoscopic**   **3D**  imaging viewing system of the present invention
implementating a full color analgyph  **conversion** , in which color signal
blanking and summing hardware (possibly in the form of a dongle) is
used to covert page-flipped  **stereoscopic**  images to an anaglyph
1 0  **stereoscopic**  image format.

DETAILED DESCRIPTION OF THE BEST MODES FOR CARRYING OUT THF,
PRESENT INVENTION
1 5
As shown in Fig. 1, the  **stereoscopic**  3- D  image viewing system of
the present invention I comprises a number system components,
namely: a...

...source 3 for
producing video signals representative of either 2-D images, or
2 0  **stereoscopic**  image pairs for 3- D   **stereoscopic**  viewing using the
timemultiplexed (i.e. field-sequential) display format; wireless
**stereoscopic**  3- D  eyewear (e.g. viewing glasses) 4 having left and  ...
shutter-state control
signals, and (iii) transmitting the same to one or more pairs of
 **stereoscopic**  3- D  viewing glasses wirelessly lined to the transmitter,
for
reception, decoding and use in switching the...

...to-Head 2-D Viewing Mode illustrated in Fig. 613; and an Active

Stereo 3- D Viewing Mode illustrated in Fig. 6C. While each of these modes of operation will be...

...now that in each such mode of operation, each viewer wears a pair of the **stereoscopic** 3- D viewing glasses so that its left and right electro-optical viewing shutters thereof are positioned system with a VGA/SVGA video board, a **stereoscopic** video camera, or other 0 image signal generation device as shown the various configurations set ...

...CRT-based display device adapted for receiving composite video signals must be used with the **stereoscopic** 3- D image viewing system. Likewise, when using a video signal source that produces a "computer video...

...CRT-based display device adapted for receiving computer video signals must be used with the **stereoscopic** 3-1) image viewing system. Notably, however, the shutter state control signal transmitter of the...

...shutter-state control signal transmitter, unknown in the prior art.

As shown in Fig. 1A, **stereoscopic** 3- D eyewear of the present
22
invention comprises: a lightweight plastic frame 8 having a frontal...

...switch the optical state of the viewing shutters 9A and 913, in synchronism with the **stereoscopic** image pairs being sequentially displayed on the CRT display device, to realize the field-sequential
5 **stereoscopic** display technique.

As shown in greater detail in Fig. 113, each electro-optical viewing
·shutter 9A, 9B in the **stereoscopic** eyewear of the present invention comprises a cell structure 13 consisting of first and second...this design constraint, it is possible to avoid the need for high voltage DC-DC **converters** (as
24
required as with current technologies) and obtain long operational life.

As schematically illustrated...

...the "video signal source/CRT display blocks" of Fig. 3, namely 3 and 3', the **stereoscopic** viewing system of the present invention supports two different techniques for displaying time-multiplexed (i then **converted** to a time multiplexed pair
5 of image streams by the interlacing hardware of the...

...them one after another into a single image buffer, or by copying them into two **separate** **image** buffers and then rapidly switching the display device between the two buffers.

In Fig. 3 the
**stereoscopic** 3- D viewing glasses of the present invention. In general,

this process involves: analyzing (i.e. counting...and/or Blocks
B-C-D-I-J-K-L-B, the
Active Stereo 3- D Mode is enabled, shown in Fig. 6C. When the process
follows the loop through Blocks...

...are no IR digitally encoded shutter-state control signals sent from
the transmitter to the **stereosco**pic 3-13 viewing glasses hereof and
thus
0 the viewing glasses enter its Power-Conservation...

...processor (embodied within the frame) goes into
its ultra-low power consuming "Sleep Mode". The **stereoscopic** eyewear
remains in its Passive Mode until either an IR L-pulse train or an IR
Rpulse train is received at the **stereoscopic** viewing glasses, at which
time the **stereoscopic** viewing glasses reenters its Active Mode.
As illustrated in the system diagram of Fig. 4, the **stereoscopic**
viewing glasses embody miniature PC board, on which is mounted: an
ultra-low power consuming...

...DL and DR , to left and right TN LC shutters 9A, 9B
a DC-DC **converter** IC 43 for providing a stepped up voltage to the power
input of transistor-based input
port of the DC-DC **converter** 43.; a power-off timer 45; and an
oscillator
46, arranged as shown.

As shown...

...4, a number of functions elements are realized
within programmed RISC processor 41 within the **stereoscopic** eyewear
of the present invention. In particular, a waveform shaping circuit 47 is
provided for...

...pulse trains from the waveform shaping circuit 47 and
determining whether it is represents a **left** shutter-state control
**signal**
(i.e. L=0 or a **right** shutter control **signal** (i.e. R=1 ). These
decoded
shutter-state control signals are provided as signal input...

...transistorbased LCD driver circuitry is to generate a left shutter drive
voltage DL when a **left** shutter-state control **signal** (i.e. L=1) is
received as input,
generates a right shutter drive voltage DR when a **right** shutter-state
control **signal** (i.e. R=1) is received as input, and generate no shutter
drive voltage when a neither a left or **right** shutter-state control
**signal** is received as input to transistor-based LCD driver circuitry.

During operation, the system of...

...and vertical synchronization signals thereof, and
produce appropriate shutter controls signals for automatically operating
the **stereoscopic** shutter glasses of the present invention in accordance
therewith, without operator intervention. As such, the...

...and transmits control signals which place both shutters in the
transmissive state indicating a non- **stereoscopic** video image is to be

viewed.

In Fig. 5B, the timing relationship is graphically illustrated
between the horizontal and vertical synchronization signals of an
5 interlaced-encoded 3- **D** VGA computer video signal. As shown, an
consistent with the logic of the process of...relationship is graphically
illustrated
between the horizontal and vertical synchronization signals of a
page-flipped **3D** VGA computer video signal. As shown, and consistant
31
signals prior to the vertical blanking...

...train) information may be
of much larger widths. Consequently, thus the detection circuitry within
the **stereoscopic** viewing glasses of the present invention can function
at
much slower clocking speeds and with...

...the
1 5 characteristics of the pulse transitions, it is possible to create a
universal **stereoscopic** viewing system with exceptionally long battery
life.

For current computer systems the Video Graphics Adaptor...provides a
basis for controlling a pair of LCD shutter glasses
synchronized to sequentially displayed **stereoscopic** images. The display
1 5 timings can be encoded in such a manner that one...

...clear non-shuttering state
when 2D images are displayed or switch states in response to **3D**
**stereoscopic** pairs alternatively displayed on the monitor.

When displaying 2D images, the image data is written...

...period is made to increase or decrease
by I in adjacent vertical periods, page flip **3D** **stereoscopic** mode is
identified and the shutters can be made to open or close in
synchronization...pairs, the exact circuitry can be utilized to operate
in interlace mode to offer stereo **viewing** with minimum flicker.

Since the system hereof is capable of displaying stereo pairs from
an...

...be utilized for displaying
stereo pairs from a standard video source.
36
the production of **3D** **stereoscopic** images.

A further enhancement to the systems described herein is to
provide a hardware line-blanking system which reduces the
requirement on the **software** **drivers** , software applications, and video
board display hardware.

This line blanking device of the present invention...

...original signal and can optionally modify the color
information to support various spectral and anaglyphic **stereoscopic**
formats as illustrated in Figs. 8 through 1 1. This is done by allowing

the...device could simultaneously
modify the sync pulse widths to communicate information to the shutter
glasses ( **signal** ) about which image ( **left**  or right) is currently being
displayed.

There are many different ways to implement a device...

...schematic drawing of Fig. 9 illustrates another possible
implementation of the dongle device, whereinline-alternate  **stereoscopic**
images are  **converted**  into spectrally multiplexed images. Instead of
blanking lines as described above, the dongle system device blocks out
specific color signals. The first time the line-alternate  **stereoscopic**
image passes through the dongle, the green color is removed from the
right image lines...

...removed from the left
  image lines which produces the first field of a spectrally encoded
   **stereoscopic**  image. The second time the line-alternate  **stereoscopic**
  image passes through the dongle, the red and blue colors are removed
  from the right...

...removed from the left
  image lines which produces the second field of a spectrally encoded
   **stereoscopic**  image. This dongle system allows line-alternate
  39
   **stereoscopic**  images to be easily  **converted**  into a spectral format
  which
  will reduce the perceived flicker. Details regarding the spectral
  multiplexing dongle device, wherein line-alternate
   **stereoscopic**  images are  **converted**  into anaglyph  **stereoscopic**
  images.
  In a fashion analogous to that illustrated in Fig. 9, a line-alternate
  0  **stereoscopic**  image has its color components selectively removed or
  summed to  **convert**  it to any of a numb er of anaglyphic formats. Fig.

  1013 shows a chart...

...of Fig. 11 shows another possible
  5 implementation of the dongle device, wherein page flipped  **stereoscopic**

  images are  **converted**  into spectral  **stereoscopic**  images or anaglyph
   **stereoscopic**  images. For page-flipped  **stereoscopic**  images, from
  either a
  computer display adapter or a video source, the right and left
   **stereoscopic**  image pairs are sequentially output to the display. There
  is typically a special jack which is used to indicate whether a right or
  **left**
  image is being  **output** . Sometimes this signalling is encoded into the
  video information either in the rgb lines or...

...dongle) detects a right image, it modifies the color
  of the image to encode the  **right**   **view**  in anaglyph or spectral
  formats.
  When the dongle device detects a left image, it modifies the color of the
  image to encode the  **left**   **view**  in anaglyph or spectral formats. The
  specific color mappings used depend on the particular spectral...

...systems but can also be applied to component video systems and composite systems which are **converted** into component formats for TV and video monitor applications.

If a narrow band retardation element...

...0 polarizers (20) of the cell shown in Fig. 113, then the cell can be **converted** to a spectral decoding cell. The narrow band retardation element allows selected wavelengths of light...

Claim
1 A **stereoscopic** 3- **D** image viewing system for stereoscopically viewing
3- **D** images displayed on either a CRT computer or video display device.

2 The **stereoscopic** 3- **D** image viewing system of claim 1, wherein **stereoscopic** 3- **D** shutter-type viewing glasses are used to view **stereoscopic** image pairs displayed on a CRT computer or video display 1 0 device according the time-multiplexing display technique.

3 The **stereoscopic** 3- **D** image viewing system of claim 1, signal decoding and processing is minimized within the **stereoscopic** 3- **D** shutter-type viewing glasses in order to reduce the cost of manufacture 1 5 thereof, while providing extended battery life.

4 A **stereoscopic** 3- **D** image viewing system for stereoscopically viewing 3- **D** images displayed on either a CRT computer or video display device.
0

5 The **stereoscopic** 3- **D** image viewing system of claim 4, wherein a pair
of lightweight **stereoscopic** 3- **D** shutter-type viewing glasses are used to
view **stereoscopic** image pairs displayed on a CRT computer or video display device according the time-multiplexing display technique.
5

6 The **stereoscopic** 3- **D** image viewing system of claim 4, wherein signal decoding and processing is minimized within the **stereoscopic** 3- **D**
shutter-type viewing glasses in order to reduce the cost of manufacture thereof, while providing extended battery life.
4 3
. The **stereoscopic** 3- **D** image viewing system of claim 4, wherein a pair of LCD shutter glasses having a...

...decoding micropolarized spatially-multiplexed images displayed from an spatially-multiplexed image display system.

8 The **stereoscopic** 3- **D** image viewing system of claim 4, wherein a means is provided for detecting stereoscopically-encoded...
...pairs of optical
state varying LCD shutters via pulse width modulated infrared pulses.

9 The **stereoscopic** 3- **D** image viewing system of claim 4, wherein one shutter switches to the transmissive state while...

...to a specific field of
information displayed on the CRT or display device.

10 The **stereoscopic** 3- **D** image viewing system of claim 4, which has a
display mode that allows two viewers, wearing two separate pairs of
LCD glasses to view two **separate** images simultaneously on the same
display screen, thereby allowing the two viewer to play a head-to-head
video **game** on the same viewing screen without interference.

11 The **stereoscopic** 3- **D** image viewing system of claim 5, wherein the
polarization axis of the LCD shutters glasses...

...passive
polarizing glasses to stereoscopically view spatially multiplexed images
(S M 1).
4 4
. The **stereoscopic** 3- **D** image viewing system of claim 4, which has
several different modes of operation which make it possible for a
viewer, in a multi-format **stereoscopic** environment, to view a variety
of
**stereoscopic** images with the same viewing glasses.

13 A method of generating synchronization signals for use in a
**stereoscopic** viewing system which employs low cost, twisted nernatic
(TN) liquid crystal (LQ displays as the...

...is required by said optical shutters, thereby
substantially increasing battery life.

18 A shutter-based **stereoscopic** 3- **D** viewing system, comprising:
a pair of optical shutters glasses;
a synchronization signal transmitter having a...and places both of said
optical
shutters in the optically transmissive state indicating a non-
**stereoscopic** video image is to be viewed.
47
. Shutter glasses for use with a control device...
...of
the LCD-type optical shutters at the corresponding video field rates for
0 viewing **stereoscopic** video images.

23 Shutter glasses for use with a control device that produces IR
shutter...

...48
transmissive state, for use in stereoscopically viewing linearly
polarized spatial multiplexed images.

26 A **stereoscopic** 3- **D** image viewing system based on the spatially
multiplexed image (SMI) display format, comprising:
a pair...

...other
signalling on different video signal lines to differentiate between the
right and left images ( **signalling** to the glasses and/or xmitter).
1 5

28 Anticipation circuitry in combination with battery...
...shutters in order to minimize the consumption of battery power.

29 A pair of 3- **D** shutter glasses capable of supporting spectral
multiplexing for all video formats.

30 A system which...fifth mode of operation for supporting head-to head
viewing.

34 A system for 3- **D** **stereoscopic** viewing comprising:
means for **converting** page-flipped or line-alternate **stereoscopic**
image formats into time sequential spectral or anaglyph **stereoscopic**
formats.

35 A system for 3- **D** **stereoscopic** viewing comprising:
means for carrying out line-blanking in order to reduce software
and video card requirements of said system.

36 A **stereoscopic** 3- **D** viewing system comprising:
portable electro-optical viewing glasses; and
shutter-state control signal transmitter having multiple modes of
operation for **stereoscopic** viewing of 3- **D** images displayed in
different
 **stereoscopic** image formats.
50
. A line-blanking device connectable between a computer display
adapter and a...

...information of said non-interlaced
video signal in order to support various spectral and anaglyphic
 **stereoscopic** formats.
1 5
The line-blanking device of claim 38, which comprises:
means for allowing...

00358797
**AN INTERACTIVE COMPUTER SYSTEM FOR CREATING THREE-DIMENSIONAL IMAGE INFORMATION AND FOR CONVERTING TWO-DIMENSIONAL IMAGE INFORMATION FOR THREE-DIMENSIONAL DISPLAY SYSTEMS**
**SYSTEME INFORMATIQUE INTERACTIF SERVANT A CREER DES INFORMATIONS D'IMAGES TRIDIMENSIONNELLES ET A CONVERTIR DES INFORMATIONS D'IMAGES BIDIMENSIONNELLES POUR DES SYSTEMES D'AFFICHAGE TRIDIMENSIONNELS**
Patent Applicant/Assignee:
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Inventor(s):
  GESHWIND David M,
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  Detailed Description
  Claims

Detailed Description
...  or size, along the Z-axis would be displayed as a cursor, positionable
in all **three dimensions** , and may be controlled by any appropriate
computer control mechanism now in use or later...input transducers may be
used, such as a knob, foot pedal, joystick, 'data glove', 3- **D** input
device as described below, ...arbitrarily shaped matte, or to those
pixels under the shape of the brush. For 3- **D** painting, these 2-D
algorithms can be applied to ...plane, or may be generalized to be
applied to all the pixels in a 3- **D** rectangular solid, other arbitrarily
shaped 3- **D** volume or, in particular, within the volume of a 3- **D** brush
shape

The image processing algorithms may be generalized to 3- **D** form as well;
for example, 'blurring' or 'softening' functions are often implemented as
algorithms that to individual 2-D planes that are 'stacked' in 3- **D**
space, working only on the pixels at a specified depth or range of
depths. In...D- or Z-) buffer": The above describes a convenient usable
system for creating and modifying **stereoscopic** images. However, the 3-
**D** effect depends not only on horizontal parallax, but on the proper
obscuring (which is subtly...

...visual cues of parallax and obscuring are inconsistent, confusion
results and the perception of 3- **D** is destroyed. By painting from back
to front, one may guarantee that this aspect is...Alternately, for
color-mapped devices, a single number is stored at each pixel and is
**translated** into Red, Green and Blue values by using it as an index into
tables of  ...by those items; and, pixel transparency

For computer rendering of 2-D images of '3- **D** solid' (but not **stereoscopic** ) mathematical models, depth information is sometimes stored for each pixel to facilitate the proper display...thousand divisions) for the proper mathematical placement of objects in the computer's simulated 3- **D** (but still displayed as 2-D) environment

While a 16-bit buffer may be used...D direction is one way that may be used to advantage for simulating true 3- **D** perspective. In this way, a relatively small number of
possible D values may be used...be in planes parallel to the CRT faceplate. They may be tilted planes or 3- **D** 'sculpted' elements. In that case there may be several planar elements with most of the... positions, a pair of continuous smooth image elements may be created for the left- and **right** -eye **views** by interpolating between those edges or corners. Because of the simple geometry associated with tilted...used to derive interleaved or separate left and right images from the higher resolution 3- **D** display. For example three ...one pixel which may provide widely spaced planes or parts of objects in synthesized 3- **D** space

However, an interpolative technique, similar to that used to display information stored at different...light source(s) may be specified and correctly calculated shadows may be cast in 3- **D** -space by some or all objects, to add realism to the final image. If either...created only on the fly by properly offsetting
and mixing the output signals from the **multiple** **display** buffer sections

An additional advantage associated with this technique is that for many situations only...or micro-positioning; or the bordering objects for other situations

A PREFERRED EMBODIMENT
A '3- **D** Computer Paint System' has been programmed in the computer language 'C' by the applicant as shuttered 3- **D** glasses

As explained more fully above, the 'row table' feature of the AT-VISTA can 2-D and 3- **D** images, full screen or partial windows, at various resolutions (512, 640, 756/768, 1008/1024, 1512/1536) with proper aspect ratio **conversion**

In order to simplify programming and operation, both the 'canvas' upon which the image is...flat or multi-depth function is to be referenced. Alternately, when connected to a 3- **D** input device, the selected plane may also be dynamically and continuously selected along with the. X and Y position

The 3- **D** paint system has many usual elements, menus of buttons, color and brush palettes, sub-menus, etc.
but these are displayed and work in a uniquely 3- **D** way

All buttons and palettes float upon a menu plane which, in turn, floats above...above the plane of the button. In addition, the buttons cast drop shadows in 3- **D** . Normally drop shadows are dark areas the same shape as the casting object offset down...many 2-D elements partially obscure each other. It is potentially useful to use the **stereoscopic** display techniques described herein to make such GUIs into 3- **D** user

interfaces to assist users navigating through such crowded interfaces

All options and features may...etc. have been generalized to 'bricks'
which delineate
a rectangular solid space in the 3- **D** canvass

Various methods are available to protect particular pixels from being
effected by the painting...calculation (culling the points considered for
the calculation of a digital filter, over a 3- **D** kernel, for example),
and the second after calculation (culling which points are to be updated
...The list can only get shorter as pixels are rejected by various tests

The 3- **D** paint system has many different paint modes; some are similar
to 2-D paint systems...a calculation based only on the canvas pixels'
values, based on some parameters. For example, **several image**
processing functions can be attached to the tip of the brush to
selectively adjust level...mode will be described; Shape paint painting
is done on the surface of a 3- **D** shape already in the frame buffer,
changing the surface look but not the depth shape...map) or may be
rendered by other software and imported, or rendered by the 3- **D** paint
system. In addition, libraries of precomputed shapes may be made
available to the operator...

...those objects to be re-painted without disturbing their shape

The ability to create 3- **D** objects by stacking painted contours, as
well as to import and combine 3- **D** objects from other sources, and to
'Shape paint' provide a flexible mechanism for a painter or illustrator
to create 3- **D** objects and environments. One particularly useful
application for this system will be the creation of such objects and
environments for inclusion in Virtual Reality simulation systems.
These 'illustrations with depth' can be **converted** by software utilities
to the appropriate file formats for such VR rendering systems

Although the distance between planes. A 3- **D** line or polygon may be
drawn by adding appropriate parallax offsets to the end-points...

...problem results in that while the image may appear to be smoothly
spanning a 3- **D** space, the depth values stored for those visible pixels
will be quantized or 'stairstepped'. This...AND EMBODIMENTS
It must be understood that the parallax shifts associated with the left
and **right** eye **views** , in effect, change the point of view (POV) of the
viewer of the multi-plane...
...be shifted. Several useful variations result

First, even without glasses or any kind of binocular **stereoscopy** , the
POV may be shifted in 'wiggling' motion to produce 'motion (serial)
parallax' which can...those created by the instant system, this method
can be very useful to convey 3- **D** information without any glasses. For,
scientific, industrial, military, educational or medical imaging, 3- **D**
visualization of data can be achieved without glasses

The applicant has found that five such and L) - a strong 3- **D** effect can
be achieved by alternating them in the following order: L, 1, N, r...
appropriate perspective as the viewer moves around the room; this is a
very powerful 3- **D** (though not binocular) effect. The combination of 3-
**D** glasses and the head-tracker (or a **head** -mounted **display** ) produce

an even more powerful effect. In that case, not only head position but orientation...

...eyes

Such a system is a low-end alternative to costly full-immersion helmet-based **Virtual Reality** displays. When using such a system and drastically changing ...only will 2-D images and motion sequences be able to be adapted to 3- **D** **stereoscopic** displays, but may also be adapted for use with **Virtual Reality** systems

Systems have been disclosed, such as that by NYIT, where two images may be...to distort the single image, once to the left, once to the right, to create **stereoscopic** paired image streams

When distorting such a single image into left and right images, (or...a framestore device may be easily modified to solve the flicker problem associated with 3- 1D electronic LCD-shuttered glasses which deliver only 30 fields to each eye. Similarly, because the...alternated, with all the variations described above, for the reception of both color and 3- **D** information on a composite monitor

To achieve color perception the red and green images can...for a basic high-level system diagram of the above

As described above, the 3- **D** paint system will operate at a continuously and dynamically selected depth with the addition of a 3- **D** input device. Such a device is described in the following pages
For inputting positional information...on the X-Y plane; or, for other rotational information, such as to rotate 3- **D** objects in a computer graphic or CAD system. Alternately, the input may be used as s magnitude parameter, for example to **translate** along the Z- ...Z data (along with the button hit information as
well)

The two-ball mouse's **software driver** will pass on the X, Y, Z and button-state information to applications programmed to...controlling the angle or tilt of the 'pen' by twisting the mouse. Similarly, for 3- **D** modeling or sculpting, an oriented chisel-like function may be implemented

Or, using the two....Such an embodiment may be particularly useful for systems used to design and produce 3- **D** computer animation. In such systems it is often required to specify (at least for key...specific configurations, uses and gestures described above, with additional input axes available, the possibilities for **games** , 3- **D** animation, computer aided design, machine or robot control, or other user interfaces are greatly increased...to: analog and digital circuitry; special purpose circuitry and general purpose circuitry running software; various **3D** displays, such as those employing passive or active glasses, lenticular screens, CRT displays, holographic film, **virtual reality** and serial motion parallax; trackballs, mice, styluses and data tablets, or other position or input...

Claim
... brushoriented painting and pen-oriented drawing functions, wherein

said improvement comprises the creation of three- **dimensional** image
information, wherein said three- **dimensional** creation is effected by the
maintenance of a plurality of image information memories and the...in a
second of said image information memories.

2. A method for integrating 2D and **3D** image elements by utilizing the
method of claim 1.
15

3. A method for modifying a **3D** image by utilizing the method of claim
1.

4. A method as in claim I...right image information memories are each
maintained as separate contiguous areas of memory and three- **dimensional**
combination is effected only upon display.

10. A method as in claim 8 wherein said...image information memories are
then parallax shifted with respect to each other, and subsequently an
**additional** **image** element is loaded into both left and right image
information memories without offset.
5

12...image memory value without updating the depth image memory value.

22. A method for creating **virtual** **reality** databases whereby at least
some three- **dimensional** image is created by the method of claim 12, and
**virtual** **reality** shape information is derived from the depth
information of said three- **dimensional** image.

23. A method as in claim 22 whereby, in addition, **virtual** **reality**
texture information is derived from the color information of said three-
**dimensional** image.

24. A method as in claim 23 applied to the frames of a motion...

...the geometry of elements contained in the motion picture.

26. A method for modifying a **stereoscopic** image ...A device as in
claim 37 wherein the plurality of transducers comprises at least two
**translation** transducers which when used in a coordinated fashion specify
**translation** and when used in an anti-coordinated fashion specify
rotation.
40

40. A device for...that for which an image being displayed is intended.
25

47. A method for compatible **stereoscopic** broadcast comprising: the
broadcast of a two-dimensional image which may be displayed on a...
modified with respect to said two-dimensional image based upon said depth
information; and, the **stereoscopic** display of said two images.

48. A method as in claim 47 wherein said depth...

...be modified based upon said depth information.

49. A method for the creation of a **stereoscopic** display comprising the

interleaving of at least two images, wherein at least some of theA improved method for the creation of an anaglyphic **stereoscopic** display on a composite video monitor, wherein the improvement comprises the interleaving of segments tinted...

...to-frame basis by a variable STS scheme.
52. An improved method for creating three- **dimensional** images wherein the improvement comprises that for areas of ambiguous or uncertain depth, ...51.

69. A product produced by the method of claim 1 and embodied as a **stereoscopic** pair of film images.

70. A product produced ...by an information bearing medium.

73. An improved method for the creation of an anaglyphic **stereoscopic** display on a composite video monitor, wherein the improvement comprises the interleaving of segments tinted...

DIALOG(R)File 349:PCT FULLTEXT
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00180374     **Image available**
**IMAGING SYSTEMS**
**SYSTEMES D'IMAGERIE**
Patent Applicant/Assignee:
  DELTA SYSTEM DESIGN LIMITED,
  ASHBEY James Amachi,
Inventor(s):
  ASHBEY James Amachi,
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Fulltext Availability:
  Detailed Description
  Claims

English Abstract
  A **3D** viewing system displays two displaced images on a screen. A screen
  overlay positional between the...

Detailed Description
  IMAGING SYSTEMS
  This invention relates to **3** **dimensional** viewan g systems and an
  particular to systems for displaying cinematogrpahic films and to
  systems for displaying television pictures,
  In the past, **3 - D** viewing system have been produced by shooting a
  scene with two caneras thus providing two...

  ...the scene were being viewed
  in real life thereby enabling the brain to reconstruct a
  **threedimensional** view of the displayed image.

  In these systems the viewer is obliged to wear special glasses to
  see the **3 - D** image, Another drawback is the fact that because of the
  colour filtering it is not possible to view a full colour image in
  **3 - D** .

  One object of the present invention is to enable a **3 - D** image to be
  vieweed on a screen without the need for special glasses to be worn
  by viewers.
  Another object of the present invention is to enable **3 - D** images to
  be viewed in full colour.

  Another object is to enable **3 - D** images to be produced from source
  material filmed in 2-D format.

The principles behind the present invention are.

That "optical image displacement", in binocular- **stereo   vision** ,
encodes (Ineuro@cognitivelyl) for depth
2 , That this optical displacement produced naturally by the fact...of
the observer. Deep vision is a hardware and
software system .

9 . And that the  **3 - D**  effect as conveyed hither-to, in conventional
 **3 - D**  systems through specially prepared glasses, can be recreated
through the use of a special screen, placed over the video screen
for  **3 - D**  television, or placed over the projection screen for  **3 - D**
cinema.

10. That the creation of Deep Vision  **3 - D**  software is achieved in
single lens system (single recording camera/single point of view),
entirely...

...than the duration of the filmed material
itself.

11. That Deep Vision is capable of  **converting**  every film ever made
in colour or black and white into a  **3 - D**  filxn and will allow every  **3**

 **D**  film, either created from a single lens system or from a two-lens
stereo recording...

....be viewed without the aid of
special glasses.

12, That Deep Vision is capable of  **converting**  every photograph or
still image into a  **3 - D**  photograph or image, in either colour or
black and white.

According to one aspect of...in
static media photographs, prints and posters.

D1. A description of the principle behind conventional  **3 - D**  systems,
D2. A description of the principle of stereo projection, from the
pixels of the...

...Deep Vision: Front projection.

G2, overview I
Overview II
Overview III
Deep vision is a  **3 - D**  system which takes its origins in the design of
man and woman and owes its...clearest.

Al, The principle behind the neuro cognitive encDd:Lng-decod3
ng
of depth for  **stereo   vision** .

Our visual understanding of depth: our conscious perception
of depth, is generated. It is generated...One of the ways to describe
parallax, is that objects in view
undergo both a  **translation**  and a rotation, the degree of  **translation**

and rotation is more pronounced between the eyes for objects that
are closed to the viewer. (See Fig.4).
Although in reality this **translation** and rotation are **3
·dimensional** transformations! it is possible to simulate to a degree
by applying two co-ordinate **translation** and rotation functions to a
2-dimensional original image. Indeed most optical digital effects
processors altenative format a further
**translation** (lateral displacement) function is applied to the copy,
and in another the same 2-D...

...of parallax with the exception of occlusion. one of the reasons that two
duTensional. rotation **translations** are as effective as they are, is
that the brain seldom brings to bear the...

...parallax effect, for the closer moving objects
are to the camara, the greater the discrepancy ( **translation** ,
rotation, enlargement) from frame to frame, which accords with the
increasing parallax transformations for objects...line – being of the
different colours.

B1
The electronic sub-systezm required to achieve the **conversion**
of a conventional video signal into a Deep Vision signal.
Digital processors at the micro...

...three basic formats,
Colour Overlay
Each image would be colour-changed digitally, with A-D
**converters** being a suggested route,, a colour-correcter would also
achieve a colour change but the signal would not be as crisp. Each
image would then be **converted** into three separate signals, red,
green and blue – care must be taken to ensure that...

...into one,
effectively overlaying one colour plane onto the other.

Time Displacement
A framestore, which **converts** each analogue frame into a digital
– 15 frame, is capable of delaying the signal by...optical effects
generator which is capable of image rotation
about variable vertical axes, within a **3 - D** space, (See Fig.5)
lateral Displacements
The lateral displacements required can be achieved by any...software
encoding for static media.
There are two broad categories – single image source and dual
( **stereo** ) **image** source – in the case of the former we may have a
photograph taken long ago, in which the source – the original image
is long gone – and we must recreate our **stereo** **images** from the
single angle orientation that was recorded, perhaps yesterday
perhaps last century between camera...

...of the above three errploys a 2-D transformation in the
stead of a live **3 - D** transformation.

However, when the possibility to take a second true altered
position exists, it should be used, so that the displaced images to
be processed represent a genuine **3 - D** change, ·

Only two of the composite formats are then available, the best
of these being...ezployed to focus both images on the same area
on the large screen.
If the **software** is line **multiplexed** then it will take the same
format as conventional celluloid software, with the exception of...

...to sacrifice depth in order to
convey notion. (see :Animedia.).
D1. The principle behind conventional  **3 - D**  system.

Conventi.onal  **3 - D**  systems, usually encode through the use of two
cameras, the image displaceoent going directly onto the dical record
medium; film of video.  **3 - D**  systems now exist that use a single lens
and chromatic inbalance between the eyes together...

...frames and is capable of sending
full colour to each eye.

However nearly all demonstrated  **3 - D**  systems hitherto, whether
plane polarized or chromatic, all require of the viewer the wearing
of...

...kakes no such requirement of the viewer.

- 21
The reason for special glasses in conventional  **3 - D**  systems, is
that as the proper-ties of the lens filters covering each eye, are...

...receive the sc-ime in-age as does the
right eye, In this way the **stereo   vision**  effect is recreated (see
Fig. 19). The different images that each eye receives, contain
positional...right, and vice versa.

This permeability gate, will reproduce the left-right eye
differences, of **stereo    vision** , and it works on a wavelength or
polarity filtering basis, so that regardless of the...

...as it does not interact with the
viewers relocation relative to the screen.

With conventional  **3 - D**  systems, the Colourl or Colour2
wavelengths the alternate colour planes (or equivalent) projected
from each...

...3) Colour separation and line multiplexing
Line Multipleoxing
Line multiplexing takes its rigour as a  **3 - D**  software format
from the fact that upon successful decoding each eye is presented
with a...

...image, the difference encoding for
depth: this is a good mimicry of observed reality,
Line **multiplexed** Deep Vision **software**  (the cmposite image)
exists as adjacent vertical columas lines, each line being frm one
of...

...the above requirements are it, and if satisfied the screen will

decode the composite line **multiplexed   software**  for each eye.

For example the shadow mask could be  ...the principle of each eye seeing
only one image and so retains the
sensation of **stereo   vision** -depth. However the shadow mask screen
is unable to dedicate one of the displaced images...displacement of the
eyes is
created; this recreates the conditions hitherto described for Deep
Vision **stereo   vision** , with a different intensity of the red image
o-4 .7@p:ro uT -';aTcrissod...but when positioned correctly
each projectors, image corresponds to the other projectors, shadow,
creating a **dual   image** line mltiplexed. conposite on the back of the
projection screen, A giant grid is then...L= MULTIPLEX FORMAT
This format has the same arrangements of elements as found in
line **multiplex   software** see (A) to (E) above; however in each case
once the composite image is on...arrangement of elements, Deep Vision is
coubined with Chrcmascan (British Patent No. ) , producing  ·
high definition **3 - D** , the sensation will be under certain conditions
an assault on the senses - hopefully pleasurable, with...screens, the
result will be high speed - which is high resolution/
high definition combined with **3 - D** .

It will seem more real than real: 4-D.

F1 Deep Vision: plane polarising system...has been tried and successfully
tested, one of Deep
Visions U=Vat'Ons is the **converting**  of existing film black and
white or colour, filmed at whatever point in time,, into full colour
or black and white **3 - D**  films.

F Deep.Vision: Static Media
The two applicable Deep vision formats.

(1) Line multiplex
(2) Colour separation and line multiplex
lend thenselves imnediately to the creation of **3 - D**  photographs,,
Posters and other static media, with line grid-shadow mask being
Perspex or even...
...book,
In magazines given the very high resolution (fine graini, small
pixel size) the line **multiplex   software** lines could be O=emely
thin,, if this is sufficiently so, cling film as a...

...D source - a photograph, drawing or
painting, (historic)
(2) Preparation from (a real situation) a **3 - D**  source, (realtime)
In the case of (1) the Deep  ...ages are taken from the
"image environment", these two images would contain between then
real **3 - D**  discrepancies, which the pseudo-steroscopic 2-D
transformation in the case of (1) sought to...

...an already prepared Deep Vision decoder screen, would be a
stereo still. Monochrome hard copy - **3 - D**  monochrcme still.

F3 Deep Vision "Moving Posters": 'Animedial,
Deep Vision 'Animedial simply involves replacing the...

...or the viewer, move laterally to
each other the image will animate between the key **games** .
The design of the decoder screen will change as one varies the
nunber of integrated...

...sensation would be discernible.

F4 Deep Vision: Computer Software
All computer images generated can be **converted** into Deep
Vision computer images, by the inclusion in the program of certain
Deep Visionwuld be
capable of taking the program video output as standard, without
alteration and **converting** it into a Deep Vision signal. The
processors in the chip (microprocessor-) or pcb would...the plane of the
monitor screen - seeming to
project forward out of the monitor plane; **conversely** these objects
that are located further away fran the recording cameras than the
cross-over...

...region at different positions within
the scene, the entire perspective of the scene - in true **3 - D** can be
radically altered, this is optical computing - at a level far beyond
the capability...
...set up each opticcomputing systein as a real-time system.

F6. Deep Vision - Surround Vision **Stereo Vision** .

Deep Vision can be used to create the next generation of
televisions - and they should...

...Vision III will consist of a minimum of two television
monitors see Fig. 65,, the **software** will be line **multiplexed** ..

However instead of each television having an image consisting of two
displaced images-integrated-line...over view
Deep Vision although it is unique in the impact that it
delivers, natural **3 - D** , with a depth of focus capable of simulating
an image reality that stretches for miles...that one is struck by how
strange it is to see black and
white in **3 - D** as one never normally does.

- so Deep Vision is science and art adding to reality...

...of veto will be given to all
surviving directors on whether their work should be **converted** so
that the world may see things as they were at the set, as this...

...must
be the servant of the art and not its master.

Deep Vision is a **3 - D** system; and it takes its origins in the
design of man and woman and owes...

...economies that this has come to make.

Deep Vision, s effectiveness in being both psuedo- **stereoscopic**
(stereo fran mono) and autostereoscopic (without viewing glasses) is

certainly a reminder to me that...the level of precision and alignment that they
support. This would introduce the experience of  3 - D . AFter this
Deep Vision II format tapes could be made available, designed to In all
...

...a polarizing system and as a
consequence it is unlike most if not all moving  3 - D  systems. Also
the Deep Vision decoder screen, requires no lens of any description,
indeed Deep...
...degree of lateral displacement. As a post-production exercise,
Deep Vision seems unlike all those  3 - D  systems that require special
original software.

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The autostereoscopic principle of the decoder screen, can...

...patterns (e.g. the alphabet).

Goodbye to 2-D, and thank you.

Deep Vision is  **stereo   vision** , each eye receiving a different
image with depth being generated internally, by a cognitive
comparison...G in sses
B. 0.

Digital Process Flow Diagram.

Line Multiple
Pattern
(A to D **Conversion** ) Mask
Video (analogue) Video Generator
Mono
F Image Frarnestore
Stereo Luminance
elec r eec r...OP4 I@V@
Colour Overlav
R 100%
Video A to D G 100%
Image 1 **Converter**  B 100
R 100%
Video A to D lop G 100%
Imacre 2 **Converter**
B 100%
Frame
Store
delay
Composite Video
Signal Mixer
Tlt4& D(SFLACEMEN7
Frame Delay
Frame...

Claim
1 A **3D**  viewing system comprising means for display
ing two
displaced images on a screen, and a...

...one of
each of the displayed images tc) each eye of the viewer.

2 A **3D** viewing system according to claim 1 in which the display
means displays alternate vertical strips...

...two images and the
screen overlay comprises alternate vertical transparent and opaque
bars,

3 A **3D** viewing system according to claijn 1 in which a first one
of the displayed images...

...displayed with an Intensaty
gradient falling in the opposite direction.
4 A method of producing **stereoscopic** images from a mnoscopic
source comprising the steps of ambining two t=a displaced in-ages
and viewing the resultant combined image with a **3D** viewing system,

5 A method of combining two displaced images for **stereoscopic**
display comprising recording alternate vertical strips of the two
images on a common record medi=.

```
Set     Items    Description
S1         53    PSEUDODRIVER? ? OR PSEUDO(3W)DRIVER? ? OR PSDD
S2      26997    SOFTWARE()DRIVER? ? OR PSEUDO()(ROUTER? ? OR REROUT??? OR -
                 DIRECT??? OR REDIRECT???) OR VIRTUAL()(DRIVER? ? OR ROUTER? ?)
                 OR PSEUDO()(API OR APPLICATION()PROGRAMMING()INTERFACE? ?)
S3       2005    MULTIPLEX????(3N)SOFTWARE? ? OR (MUXDEMUX OR MUX()DEMUX)(3-
                 N)(DRIVER? ? OR SOFTWARE? ?) OR (MULTIPLEX?????(2N)DEMULTIPLE-
                 X?????)(3N)(DRIVER? ? OR SOFTWARE? ?)
S4        895    (NVIDIA OR ASUS OR ELSA)(3W)DRIVER? ?
S5     648524    3()D OR 3D OR 3DIMENSION???? OR 3()DIMENSION???? OR THREE(-
                 )D OR THREED OR THREE()DIMENSION???? OR THREEDIMENSION????
S6      14257    STEREO()SCOP????? OR STEREOSCOP????? OR (STEREO OR TANDEM -
                 OR DUAL)()(VISION OR VIEW???? OR GRAPHIC????? OR IMAG????) OR
                 STEREOPSIS???? OR STEREOPTIC????? OR STEREO()OPTIC????? OR ST-
                 EREOVISION???
S7        475    STEREO3D OR 3DSTEREO
S8      13000    LEFT(3N)(OUTPUT???? OR SIGNAL???? OR IMAGE()DATA OR VIEW? -
                 ?)
S9      28299    RIGHT(3N)(OUTPUT???? OR SIGNAL???? OR IMAGE()DATA OR VIEW?
                 ?)
S10   3652859    GAME? ? OR VIDEOGAME? ? OR VIRTUAL()REALITY OR VIRTUAL3D OR
                 CYBERGAME? ? OR GOGGLES OR CYBERGOGGLES OR CYBERHELMET?? OR -
                 (HEAD()MOUNTED OR HEADMOUNTED)(2N)(DISPLAY??? OR DEVICE? ? OR
                 HELMET? ?)
S11   3928514    CONVERT??? OR CONVERS???? OR TRANSLAT???? OR INTERCEPT?????
S12     30082    (MULTI OR MULTIPLE OR SEPARATE OR PLURAL OR PLURALITY OR A-
                 DDITIONAL OR NUMEROUS OR SEVERAL OR MANIFOLD)()(IMAGE??? OR V-
                 IEW? ? OR DISPLAY? ?)
S13     29797    S1:S4
S14      8116    S5 AND S6
S15       140    S13 AND (S14 OR S7)
S16        81    S15 AND S8:S12
S17       140    S15:S16
S18        69    S17 AND PY<2001
S19        33    RD (unique items)
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19/3,K/1      (Item 1 from file: 9)
DIALOG(R)File   9:Business & Industry(R)
(c) 2004  The Gale Group. All rts. reserv.

1943761  Supplier Number: 01943761    (USE FORMAT 7 OR 9 FOR FULLTEXT)
**SMI's DualView enables two application displays at once**
**(Silicon Motion launches three products, including chips with proprietary**
**  high-performance embedded-DRAM interface and  3 - D  abilities)**
Electronic Buyers News, p 32
September 22, 1997
DOCUMENT TYPE: Journal  ISSN: 0164-6362  (United States)
LANGUAGE: English  RECORD TYPE: Fulltext
WORD COUNT:  525


     (USE FORMAT 7 OR 9 FOR FULLTEXT)
**(Silicon** Motion launches three products, including chips with proprietary
**  high-performance embedded-DRAM interface and**  3 - D  **abilities)**

ABSTRACT:
...launched three products, which includes chips with a proprietary
high-performance embedded-DRAM interface and  **3 - D**  capabilities.
Recently, the company announced the SM910, a 64-bit,2-D video accelerator.
SMI stated that its  **Dual - View**  architecture is the first to output two
totally  **separate**  **images**  on the two displays. The company also stated
that by developing specialized  **software**  **drivers** , SMI can offer this
capability now, without having to wait for built-in  **dual - view**
capabilities of Windows 98 operating system. The article provides                  ...
additional descriptions on the chip.

TEXT:
...the startup squarely into the midst of the market.

While desktop graphics has concentrated on  **3 - D**  entertainment,
business-presentation software remains the dominant application of the
notebook PC user. With that...

...have introduced three products, including chips with a proprietary
high-performance embedded-DRAM interface  and  **3 - D**  capabilities.

Last week, SMI announced the SM910, a 64-bit, 2-D video accelerator that...

...portion of it simultaneously on an FPD and a CRT monitor, SMI said that
its  **Dual - View**  architecture is the first to output two completely
**separate**  **images**  on the two displays.

Moreover, the two images can be uniquely shown at differing resolutions...

...particular display, we can display two different applications at once,"
Kao said.
By developing specialized  **software**  **drivers** , SMI said that it can offer
this capability now, without waiting for the built-in  **dual - view**
capabilities of Microsoft Corp.'s Windows 98 operating system.

While the LCD panel, hard drive...

...the SM810, featuring the 910 core with 2 Mbytes of EDO-class embedded
DRAM. A  **3 - D**  part with 2.5 Mbytes of embedded SGRAM-class DRAM will
follow shortly after.

"One...

08012768     Supplier Number: 66163513  (USE FORMAT 7 FOR FULLTEXT)
**3Dlabs Sells Bundle of Oxygen VX1 and StereoGraphics CrystalEyes Wired for Affordable Stereo Visualization.**
PR Newswire, pNA
April 24, 2000
Language:  English     Record Type:  Fulltext
Document Type: Newswire; Trade
Word Count:   926

...      to its worldwide distribution channel.  This complete stereo display solution, including high-quality OpenGL(R) **3D** graphics acceleration and professional-grade stereo glasses, will be offered at an MSRP of $599...

...wide range of stereo options for design professionals wanting to realize the benefits of utilizing **stereoscopic** visualization.
        Stereo displays use computer technology to recreate the way we naturally see depth by...

...giving architects, engineers, scientists, cartographers and medical and graphics professionals the best possible understanding of **three - dimensional** information - enabling faster decision-making, reduced development time and lowered costs not possible when using a normal, non-stereo **3D** display.
        "Until now, the popularity of stereo displays has been limited by the cost of...

...for StereoGraphics to broaden the availability of stereo displays as they have both industry-leading **3D** professional graphics solutions and the industry's strongest distribution channel to deliver our innovative solutions...

...from 3Dlabs and StereoGraphics."
        About StereoGraphics
        StereoGraphics Corporation is the world's leading supplier of **Stereo3D** (TM) visualization products.  StereoGraphics products allow architects, engineers, scientists, and medical and graphics professionals to...

...and software graphics accelerator solutions for workstations and design professionals. 3Dlabs develops silicon, boards and **software  drivers** to create products that effectively meet the performance and quality needs of users who rely...
...the United States and/or other countries.  StereoGraphics, CrystalEyes and ZScreen are registered trademarks and **Stereo3D** is a trademark of StereoGraphics Corporation. OpenGL is a trademark of Silicon Graphics Inc. All...
 **20000424**

**i-O Display Systems Introduces H3D Terminator** 3D **Gaming Glasses; Stereo**
  3D **Systems Offer Off-the-Screen Gaming.**
Business Wire, p0708
June 6, 2000
Language: English    Record Type:  Fulltext
Document Type: Newswire; Trade
Word Count:   483


**i-O Display Systems Introduces H3D Terminator** 3D **Gaming Glasses; Stereo**
  3D **Systems Offer Off-the-Screen Gaming.**
...      WIRE)--June 6, 2000
     i-O Display Systems, LLC, the leading manufacturer and supplier of
**stereoscopic** 3D gaming, multimedia and Internet viewing systems for
consumers, today introduced the new H3D Terminator Gaming Glasses, a vital
accessory for the future of Off-the-Screen 3D **game** play.
     The H3D Terminator system creates a realistic 3 - D **game** playing
environment by plugging into the PC and existing 3D graphic card
accelerator. The system, including lightweight **stereoscopic** glasses,
**converts** the video monitor screen into a **stereoscopic** 3 - D
environment, where images -- including characters and shapes -- come to
life before the player's eyes.
     "The H3D Terminator is the first 3 - D gaming glasses that are
lightweight, comfortable and compatible with most popular 3 - D graphics
chipsets and all the popular PC **game** titles," said Jeff Fergason,
President of i-O Display Systems. "The H3D Terminator, with its holographic
style 3D gaming environment, has proven extremely popular in Europe. Now
we offer a product priced and styled for the hungry American market."
     Several of the most popular PC video **games** are instantly supported
including Unreal Tournament, Tomb Raider, Star Wars, Need for Speed and
Draken...

...Terminator also breathes new life into older classics such as Quake and
Descent.
     The Terminator 3D glasses support a variety of graphics cards
including those based on 3dfx and NVIDIA chipsets, and support DirectX(R),
OpenGL(R) and Glide(R) **game** standards. The H3D Terminator is currently
available in two models, wired or IR wireless. The...

...system is only $79.95. The bold design of the Terminator glasses is the
first 3D glasses to combine style with the comfort of truly lightweight
design. The complete wireless glasses package, with on board electronics
and batteries, weighs a feathery 1.5 ounces.
     H3D **software** **drivers** working with the Z axis depth information
already available in nearly any modern DirectX, Glide or OpenGL **game** can
create a stereo 3D image pair -- one image for your left eye and a
slightly different image for your right eye. The H3D Terminator glasses
ensure that each eye receives the proper **signal** . The combination **left**
eye and right eye images for true depth perception cause virtual worlds to
go from...

...i-O Display Systems, LLC
     i-O Display Systems, LLC manufactures personal display devices and
**stereoscopic** 3D products used in a broad array of applications from
entertainment to medical and commercial uses...
 **20000606**

   (USE FORMAT 7 FOR FULLTEXT)
**Bang-for-the-Buck** 3D **Graphics Cards.(Hardware Review)(Evaluation)**
TEXT:
CADENCE tests seven 3D accelerators ranging from $149 to $999 to
determine the best value for less than $1...
     For our last look at graphics cards this millennium, we solicited 3D
graphics cards from all of the major manufacturers, allowing each to submit
up to two...

...of Intel's Pentium III processor with its Streaming SIMD Extensions
(SSE) that can boost 3D graphics, we have had to change our reference
benchmark system. Previously we used an HP...

...a baseline score for the Permedia 2 in the Dell system. Figure 1 graphs
the 3D AutoCAD and Lightscape test results.
     Our 2D CADMARK AutoCAD benchmark remains unchanged, except that we...

...14. Similarly, the '57 Chevy surface model we previously tested with
Release 14 and AccelView 3D is now tested with AutoCAD 2000 and its
built-in OpenGL rendering support (using Autodesk's GSTest benchmark
utility). With the GSTest benchmark we have added another 3D AutoCAD
model (an ACIS solid of a robot arm) and are also reporting results in...

...capable of running at greater resolutions (1,900x1,200 and even higher)
while still providing 3D acceleration, we are keeping the resolution for
our benchmarks at 1,024x768 to allow headroom...
...for the frame buffer, Z-buffer and texture memory. The last time we
looked at 3D graphics cards with a price as low as $199, a more common
configuration was just...

...Z-buffer depth, textures and quad buffering (relevant for the one card
here that supports **stereo   viewing** ). Some of the cards even go beyond
the onboard memory and allow texture transfers over...

...graphics card. The Oxygen VX1 performed better than the reference card
in most of the 3D tests, though not always dramatically. Curiously, it
scored only about the same in several tests...that allows quick selection
of application settings.
     The Oxygen VX1 is a good, all-around 3D solution for the beginning
and intermediate 3D user. It performs better than 3Dlabs' earlier
Permedia 2 design, and includes a useful bundle...

...including the Colorific monitor calibration utility and SoftEngine 4
enhanced AutoCAD drivers.
     Pros: Good overall 3D performance; system tray control utility
eases switching display modes.

.Cons: None significant.
Price: $299
3DIabs...

...adds a GLINT Gamma G1 geometry accelerator, boosting its performance significantly in most of the 3D tests, making it one of the three fastest cards in this review. The difference was...

...accelerator and is a great buy for its price.
    The Oxygen GVX1 is a great 3D solution for the intermediate to advanced 3D CAD user. It ranks in the top two and three in both our 2D and 3D tests, and includes a useful bundle of software including the Colorific monitor calibration utility and SoftEngine 4 enhanced AutoCAD drivers.
    Pros: Great overall 3D performance, excellent with large model Lightscape test; system tray control utility eases switching display modes ...

...connector; VESA stereo connector.
    Cons: Price.
    Price: $999
    Diamond Fire GL1
    Although Diamond's latest 3D graphics card doesn't have a real hardware geometry accelerator like the Oxygen GVX1, it...
...our test models. It bested the Fire GL1 on three out of four of our 3D AutoCAD tests and was in a dead heat with the card on the SolidWorks 98...

...chip's SSE extensions as a virtual hardware geometry engine, besting the Oxygen GVX1's 3D scores in all but the Lightscape tests. It is a great choice for anyone with a Pill workstation.
    Pros: Best overall 3D performance of the lot when installed in a dual Pentium III system; nice driver control...

...s RIVA TNT 2 Ultra graphics chip, which has become quite popular in the video **game** market, where its DirectX performance under Windows 98 is quite good. With the Windows NT...

...t do much better than our reference Permedia 2 card, and in all of the 3D AutoCAD tests it actually performed slightly worse. Its control panel offers gamma correction and a...

...drivers.
    The Viper V770 provides decent performance for its price, but does not match the 3D performance of other cards selling for $100 more. Better drivers could turn this card into...
...does, ELSA wrote its own OpenGL drivers for the card from scratch, instead of using **NVIDIA** 's **driver** . As a result the card outperforms Diamond's version in most of our 3D tests. Its performance was better in all of our 3D AutoCAD tests, about tied it in the SolidWorks 98+ test, and was ever so slightly...our testing, however, we were unable to use the driver. The card also includes ELSAview 3D , which enables an alternative method to AutoCAD 2000's 3DOrbit command for viewing models real...

...while AutoCAD's 3DOrbit command does not.
    With a moderate price and good all-around 3D performance, the Synergy II should be on your short list if you need 3D acceleration but can't spend a fortune. **ELSA** 's custom OpenGL **drivers** give this card a leg up on other NVIDIA-based boards.
    Pros: Good 3D performance for reasonable-sized models; CAD application-specific optimization settings in driver.

· Cons: None significant...

...GVX1 and Fire GL1, it was slower than most of the other cards in our  **3D**
 AutoCAD tests. It redeemed itself by turning in the third-highest score in
the SolidWorks...

...16MB of RAM for texture.
     The E&S Lightning 1200 produces mixed results among our  **3D**  tests,
taking third place in both the Lightscape and Solid Works 98+ tests, but
coming...

...in Solid Works 98+ and Lightscape tests.
     Cons: High price for moderate performance in AutoCAD  **3D**  tests.
     Price: $649
     Number Nine SR9
     The SR9 is based on the Savage4 Pro chip from S3--meant to be a
mainstream  **3D**  graphics solution. I was hoping that such a mass-market
solution might benefit from the...

...of the running, though, since the company has recently announced a
partnership with a new  **3D**  c hip developer, Pixel-Fusion, and the
resulting solution might very well wind up in...

...high-end OpenGL graphics.
     Without slighting Number Nine, the SR9 shows that mainstream,
business-oriented  **3D**  graphics cards are not well-suited for  **3D**  CAD
applications. Despite that, the card would be an excellent choice if you
don't care about  **3D**  performance and want a card that can be upgraded to
drive whatever digital monitor interface...

| Memory | shared w/frame buffer+vitual AGP | shared w/ buffer+vitual AGP | shared w/ frame buffer |
|---|---|---|---|
| Maximum **3D** resolution (true color, 75Hz) | 1,900x1,200 | 2,048x1,536 | 1,900x1,200 |
| Maximum **3D** resolution | 1,900x1,200 | 2,048x1,536 | 1,900x1,200 |
| Bus Type (ISA/ PCI/AGP... | | | |

...15MB RAM

| Texture Memory | shared w/ frame buffer | shared w/ frame buffer | 16MB RAM |
|---|---|---|---|
| Maximum **3D** resolution (true color, 75Hz) | 1,600x1,200 | 1,920x1,200 | 1,280x1,024 |
| Maximum **3D** resolution | 2,048x1,536 | 1,920x1,200 | 1,280x1,024 |
| Bus Type (ISA/ PCI/AGP... | | | |

...Controller

| | none |
|---|---|
| Frame/Local Buffer Memory | 32MB RAM |
| Texture Memory | shared w/ frame buffer |
| Maximum **3D** resolution (true color, 75Hz) | 1,600x1,200 |
| Maximum **3D** resolution | 1,920x1,440 |
| Bus Type (ISA/ | |

```
PCI/AGP
& version          AGP 4X
Video
connectors         15...
```

...past year. The market still has a long way to go in the development of
**3D** graphics solutions that provide enough quality and performance to
enable CAD users to fully realize the productivity and design benefits that
can be had by switching to a **3D** design environment. If the ability of
manufacturers to finance the significant improvements to **3D** graphics that
are needed disappears, your productivity in CAD may be affected for many
years...

...up with PixelFusion, a graphics chip technology startup company based in
England, to co-develop **3D** graphics cards using PixelFusion's massively
parallel computing technology. The card will be based on...

...in Intel's Pentium III SSE instruction set that has already demonstrated
the significant benefits **3D** graphics can gain from such parallel
computing. Slated to be available in the first half...

...a general-purpose programmable processor that can be used for many more
tasks than just **3D** graphics. It also contains 24 megabits of embedded
DRAM, which can serve as a large...

...quality...beyond even the capabilities of SCI's $70,000 Infinite Reality
2 system."
        Also, **3D** graphics leader SCI has embarked on a strategic alliance
with graphics chip vendor NVIDIA Corporation to develop future **3D**
graphics cards. As part of the deal, SGI transferred about 30 hardware and
software engineers...

...the two companies creating a product that competes at the very high-end
of the **3D** graphic market. Yet at the same time, SCI is not abandoning its
integrated Cobalt graphics...To find out just what a difference these
drivers might make, we re-ran the **3D** benchmarks for the Fire GL1 with
only one processor installed, and re-ran the benchmarks...

...with the beta Power Threads driver, the card's performance improved on
all of our **3D** tests. The results were most dramatic with the two
Lightscape tests, boosting the "2Rooms" score...

...VX1's score with SolidWorks 98+ increased from 1.28 to 1.45, and its **3D**
 AutoCAD score on the robot arm model increased from 7.55 to 10.81 fps...

...results were quite surprising. When we tested the card with only one
processor installed, its **3D** performance increased, as compared to the
two-processor configuration. When we contacted Diamond about the...

...one of the cards, for instance, features a VESA stereo sync connector
for use with **stereo** **viewing** solutions. Most of the cards' drivers offer
optimized settings for common DCC and CAD applications...
**19991101**

07049819    Supplier Number: 58245221  (USE FORMAT 7 FOR FULLTEXT)
**Benchmarks Schmenchmarks!**
Wright, Guy
Interactivity, v4, n6, p31
June, 1998
Language: English    Record Type:  Fulltext
Document Type: Magazine/Journal; Trade
Word Count:   12191


   (USE FORMAT 7 FOR FULLTEXT)
TEXT:
InterActivity torture tests > 18  **3D**  graphics boards.
...     faster than alien morph effects in Hollywood. This seems to be
especially true in the  **3D**  graphics board industry. Board and chip
companies claw and bite their way to the top...

...scoped out the market, we gathered nearly 20 boards that claim to
accelerate high-end  **3D**  applications for modelers, animators, and CAD
users. We didn't just test them. We beat...

...Unfortunately, it appears that getting to market more quickly than the
competition and promoting new  **3D**  features and capabilities is sometimes
more important than providing a fast, complete  **3D**  rendering pipeline.
Some manufacturers are taking shortcuts to market and those who buy their
boards...

...the bad news.
   ·The good news is that this frenzied competition has forced some
veteran. **3D**  board makers to readjust their thinking and pricing. What cost
more than $5,000 a...

...current board.
     OpenGL for Everybody
     Two years ago, when we wanted to compare high-end  **3D**  graphics
accelerators, all we had to do was say, "we'll only test boards that...

...shipping their new, lower-priced Permedia chip. Until then, if you
wanted to build a  **3D**  accelerator card that supported OpenGL, you either
had to use a 3Dlabs GLINT chip (or...

...a big enough installed base. The general public didn't buy a lot of
OpenGL  **3D**  accelerators because few programs required OpenGL and the
prices were high. The prices were high...
...of texture RAM. However, only a few very high-end software packages such
as Softimage  **3D**  ever use those unsupported functions (which is why a
Permedia-based board couldn't be certified for Softimage  **3D** ). These two
shortcomings of the Permedia chip may have prevented it from becoming
widely used in very high-end  **3D**  applications, but its appearance was the
catalyst that broke the  **3D**  log jam at the low end.
     Competition between board manufacturers in the consumer space has...

...to $150 range. All of them were fighting for an edge with bundling
deals, special  **game**  developer partnerships, and gimmicks like built-in TV
tuners or  **stereoscopic**  glasses. The biggest problem facing them was that,
while they had pretty much mastered 2D acceleration,  **3D**  was another beast
altogether. Until Microsoft's D3D established a foothold, there weren't any

standard **3D** APIs that board manufacturers could support (of course, neither could the software developers). Board manufacturers had to pay **game** developers to write custom versions of popular titles that could utilize a particular boards proprietary...

...and get a jump on their competition. There was also the advantage of a proven **3D** API in OpenGL (with 3Dlabs supplying the drivers). Meanwhile, D3D was becoming more stable by the week Heidi drivers were also available, so these board manufacturers could include support for **3D** Studio MAX and other Autodesk/ Kinetix packages. At the tail end of 1996, these companies ...salespeople to push them to high-end customers. At the same time, one or two **game** developers, disappointed with early versions of D3D, began developing versions of their first-person shooters...

...race was on.
     Throughout 1997, mass-market board manufacturers scrambled to catch up on the **3D** front To support the demands from the board manufacturers, other chip manufacturers such as 3Dfix, nVidia, and Real3D were forced to enhance their **3D** performance and to include support for D3D and even OpenGL As a halfway step, a few companies came out with special **3D** -only accelerator cards that worked in conjunction with a standard 2D card. All the usual graphics were handled by the 2D card, but **3D** instructions were **intercepted** and processed by the **3D** board. As more of these boards and **3D** accelerators began to hit the market, software developers began to take advantage of them (and...

...then, a slightly more robust D3D API). By Christmas, nearly half of the most popular **games** on the shelves were using realtime **3D** , most of them supported the new **3D** accelerator cards, and some even required a **3D** accelerator card. This prompted even more sales of **3D** boards on the consumer side.
     For content creators, this will mean more **3D** titles to work on, since there's more hardware to support playback It also means a new crop of **3D** cards for **3D** artists, animators, and designers on a tight budget. Finally, with dozens of low-cost **3D** boards hitting the market, people are looking for the high-end **3D** board manufacturers to justify their high-end prices.
     From the Top Down
     At the beginning of 1997, the high-end **3D** board market was dominated by Intergraph, EISA, Dynamic Pictures, and a few others. That summer...

...introduction of the Evans & Sutherland/Mitsubishi REALimage chipset The new chipset combined a greatly enhanced **3D** processor using E&S REALimage technology and specially designed **3D** -RAM from Mitsubishi. The performance improvement was, by3D board standards, dramatic. Up until then, high-end **3D** board performance had improved steadilym but only incrementally. Yes, each new card was better and...

...Diamond FireGL 4000) suddenly vaulted these two companies to the forefront of the high-end **3D** accelerator competition. A year earlier, neither of them were even in that race. Like some...
...up on the performance side. Obviously, this has been great for users of high-end **3D** software.
     Squeezing Out Polys
     So how do you improve **3D** graphics performance? It's one thing to reduce prices, but it's something else to...

...key Others point to the type and speed of RAM. Still others are reinventing the **3D** pipeline.

Companies like Dynamic Pictures, who manufacture the Oxygen line of boards (and produce their...

...by taking advantage of the new multiple CPU machines hitting the market. Their Power-Threads **software drivers** can automatically detect the presence of multiple CPUs. If you're using either an Oxygen...

...more.
Intergraph. on the other hand, is banking on their geometry acceleration technology and custom **software drivers** closely linked to specific applications. While other boards rely on the CPU to do geometry... workable alternative.
NEC, makers of the PowerVR chips used in VideoLogic boards, is restructuring the **3D** pipeline itself. They use a unique tiling approach in which each screen frame is divided...

...performance over their MX-generation chips. They accomplish this feat by taking more of the **3D** pipeline burden off the CPU including true **3D** geometry acceleration (not just setup) and **3D** lighting. GMX chips will be 3Dlab's first true geometry accelerators. They have also improved...

...feature that Softimage requires.
Who has the better solution? That's what this year's **3D** accelerator roundup was designed to uncover.
Of Boards & Benchmarks
The first hurdle was determining what...

...interested in, carefully weighed all the alternatives, and punted. "We're looking at high-end **3D** accelerator boards that support OpenGL," we said. "Send us whatever you think would be appropriate for people doing **3D** modeling, animation, CG effects, and video for interactive education, entertainment, or advertising." Developers on tight...

...We ended up creating our own set of real-world, application-based tests using Kinetix **3D** Studio MAX R2, NewTek Lig htWave **3D** , and the demo sequence in Quake H
In past years, our tests were roughly based...

...tailored for animation and modeling applications. The idea was to start with a relatively complicated **3D** scene containing a handful of primitives. Each primitive had about 20,000 polygons. Each scene...

...which were rejected), help arrived from an unexpected source. SenseB, a company that offers a **3D** API for simulation applications, called to say they were just finishing up a **3D** hardware benchmark of their own that would provide straightforward numbers. It would be so easy...very technical reasons. They also pointed out that Mitsubishi just last year entered into the **3D** graphics chipset wars with their Evans & Sutherland/Mitsubishi 3DPro/2mp Visis offering, and wouldn't...

...version. And another board manufacturer graciously pointed out that Intel is also getting into the **3D** chipset biz and reference boards with the new Intel chips seem to do extra well...

...said and done, the data pointed toward several inescapable conclusions.
* Drivers. Always get the latest **software drivers** for your board. In fact, it would be wise to regularly check your board manufacturer...
...the shelf and take your money elsewhere.
* OpenGL vs. D3D vs. Glide. The three reigning **3D** APIs each have their pluses and minuses. OpenGL has matured into a very robust, full...

...by just about all the higher-end applications. It's also gaining popularity with some **game** developers, which has inspired consumer-level board manufacturers to support OpenGL to one degree or...

...you run. For example, a rarely used transparency mode in OpenGL is used by Softimage **3D** . That particular mode is not supported by Permedia chips. This is a minor case, but...run Quake II).
      * Intergraph. In a class and category of its own, the Intergraph Intense **3D** Pro 2200s was faster than the GLINT-based boards, but not as fast as the...

...be mighty fast.
      * GLINT MX. Still holding onto a solid position in the high-end **3D** board race, the GLINT-based boards are worth checking out. They're not that great...

...an Intergraph, then I would recommend one of these boards, Of the four tested (WinFast **3D** (2520, 3Demon MX, AcceIPRO MX **3D** , and ELSA Gloria-XL), a clear winner didn't emerge. The WinFast **3D** was the fastest overall, followed by the 3Demon, AcceIPRO, and Gloria XL very close behind
...

...complete manuals and by far the largest selection of application-specific presets where the WinFast **3D** and 3Demon had the fewest. The WinFast **3D** and AccelPRO were the least expensive of the four, which might make a difference. The...

...best overall price and features was the AccelPRO. Best performance and price was the WinFast **3D** . Best features (and because of the care they take with their drivers, perhaps better performance...quality test went, both boards were nearly perfect, but neither board properly displayed textures in **3D** Studio MAX work windows. Both of these boards should work well in a Windows 95 environment or for playing **games** , but until a full lCD is implemented, they can't be considered for serious NT...

...on the same scale s the others for a number of reasons. First, this a **3D** hoard only and requires another board to handle 2D functions. We used the Diamond FireGL...

...improvement running the Gilde version of OpenGVS. Pow! The Obsidian stepped up, took over the **3D** functions and blew every other board out of the water. It wasn't even close...

...performance on LightWave and MAX seemed about the same as the Diamond board alone, Quantum **3D** has an interesting plug-in called Realistorm (actually it's more like a driver) for **3D** Studio MAX. Realistorm lets you take a geometry snap-shot of a MAX scene and...

...price doesn't bother you, then 1 would recommend you also get a hearty 2D/ **3D** board as a partner for it. If you do a lot of animation with MAX...

...Support: NT 3.5/3.51/4.0, Win95.
      Processor Support: Intel, Alpha, AMD, CYRIX.
      **3D** API Support: OpenGL, D3D Heidi, Open Inventor.
      Features: Settings for Softimage 3.01 and 3...

...Onboard RAM: 15MB 16MB texture.
      Operating System Support: NT 4.0.
      Processor Support: Intel, Alpha.

**3D** API Support: OpenGL D3D Heidi.
Features: Hardware support for overlays. Gouraud and flat shading Z
...
...Transparency. Alpha blending. Scissors test. Stipplemasking Nearest
neighbor and bilinear interpolation. 15-bit rendering in **3D**
(single-buffered windows use 24-bit). Settings for AutoCAD AVS, I-DEAS
Master Series, Micro Station. Pro/ENGINEER, Softimage **3D** SolidDesigner,
SolidWorks Unigraphics, and **3D** Studio MAX.
Suggested Retail Price: $2,995. $2,695 20MB RAM.
Rating:
Pros: Tied for...

...disc in Adobe Acrobat format (a pet peeve). Conclusion. This board
screams!
AccelGraphics
AccelPRO MX **3D**
Chipset: 3Dlabs GLINT MX with DELTA.
Onboard RAM: 8MB VRAM, 16MB DRAM.
Operating System Support: NT 4.0.
Processor Support: Pentium Pro, Pentium II, Alpha
**3D** API Support: OpenGL, Heidi.
Features: Overlay support. Fast dear and stencils. Scalable
architecture.
GLINT MX...
...of application-specific presets.
Cons: Limited documentation (on disc only).
Bottom Line: The AccelPRO MX **3D** was just about flawless in all our
tests (see screen shot below). The only problems...

...a much nicer price). Of the four GLINT-based boards we tested, the
AccelPRO MX **3D** is either tied for first or a very close second because of
the application-specific presets, good performance, and price. While not a
board for **games** , it provides plenty of speed and rock-solid image quality
for serious **3D** modelers, animators, and CAD users. This is an excellent
all-around board that won't...

...8MB SGPAM.
Operating System Support: Win95, NT 4.0.
Processor Support: Pentium Pro, Pentium II.
**3D** API Support: OpenGL, D3D, Heidi.
Features: Accelerated lines, points, triangles, interpolated
specular/diffuse lighting, dithering...

...budget and can live with the inherent Permedia limitations, this is an
excellent choice for **3D** modeling or animation on NT. This board gets the
highest price/performance ranking of the...
...8MB SGRAM.
Operating System Support Win95, NT 4.0
Processor Support: Pentium Pro, Pentium II.
**3D** API Support OpenGL, D3D, Heidi.
Features: Accelerated lines, points, triangles, interpolated
specular/diffuse lighting, dithering...

...budget, and can live with the inherent Permedia limitations, this is a
great board for **3D** animating and madding on NT. This board gets our
second-highest price/performance ranking of...

...SGRAM.
Operating System Support: Win3.51, Win95, NT 4.0. os/2.
Processor Support: Pentium.

**3D** API Support: OpenGL, D3D, Heidi, AutoCAD PowerDraft.
Features: Video in/out ports. Sub-pixel textures...diring installation. Once installed, the software provides more than 25 application-specific prefects including Softimage **3D** 3.01 and 3.51/3.7 (even though the board ins't certified for...

...Win95, NT 3.51/4.0, OS/2.
Processor Support: Pentium, Pentium Pro, Pentium II.
**3D** API Support: OpenGL, D3D, Heidi.
Features: Overlay support. Fast clear. Stencils. GLoria Settings, POWERdraft, ELSAview **3D** , and WINman Suite utilities. Multiple screen support with additional cards. Display list driver, POWERdraft for...

...Slight image quality problem on MCAD test. Pricey.
Bottom Line: The Gloria-XL's Indy **3D** image Quality tests results were flowless (see screen shot), but it was very dark in...

...2.
Onboard RAM: 8MB SGRAM.
Operating System Support Win95, NT 4.0.
Processor Support Pentium.
**3D** API Support OpenGL, D3D, Heidi.
Features: Sub-pixel textures. Bundled with True-Space 3/SE...

...texture}.
Operating System Support: Win95 (2D only), NT 3.51/4.0.
Processor Support: Pentium.
**3D** API Support: OpenGL, Heidi.
Features: Support for stereographic displays and glasses. Bundled AutoCAD utilities. 24...
...Price: $2,995 4MB CDRAM. $3,395 16MB CDRAM.
Rating:
Pros: One of the fastest **3D** boards we've ever tested. Flawless image quality. Good documentation.
Cons: Few application-specific presets...

...Onboard RAM: 8MB SGRAM
Operating System Support: Win95, NT 4.0
Processor Support: Pentium, Alpha.
**3D** API Support: OpenGL, d30 Heidi.
Features: Phong specular highlights. AGP and PCI. MPEG-2 video...with this board, download the latest drivers from Symmetric. If you want to upgrade the **3D** hardware of he Calisto 3 system, get at least a GLINT-based board.
Symmetric
Glyder...

...Onboard RAM: 8MB SGRAM.
Operating System Support: Win95, NT 4.0.
Processor Support: Pentium, Alpha.
**3D** API Support: OpenGL, D3D, Heidi.
Features: MPEG-2 video stream support, AGP and PCI versions...
...Onboard RAM: BMB SGRAM.
Operating System Support: Win95, NT 4.0.
Processor Support: Pentium, Alpha.
**3D** API Support: OpenGL, D3D, Heidi.
Features: Phong specular highlights: AGP and PCI versions available. MPEG...

...Like the other Permedia-based boards, the Glyder MAX-2 exhibited flows

in the Indy **3D** Image Quality tests, including lack of MIP mapping, 16-bit
color space, improper depth sorting...

...on a tight budget, don't intend to use all the transparency mode in
Softimage **3D** , and can live with a 16-bit Z-buffer, this is the clearly
the best of the entry-level boards.
Intergraph
Intense **3D** Pro 2200S
Chipset: Intergraph.
On board RAM: 16MB SDRAM texture, 16MB SDRAM frame.
Operating System Support: NT 4.0.
Processor Support: Pentium Pro, Pentium II
**3D** API Support OpenGL, Heidi, GDI, Intergraph RenderGL
Features: Hardware Gouraud shading. 2D & **3D** vectors and triangles.
Hardware geometry acceleration. Texture processing. Rectangle fills.
Antialiasing. Clipping. Alpha blending. Fog. Trilinear MIP mapping.
Stenciling. 24-bit Z-buffer. Genlock, multi-screen, and **stereoscopic**
display support.
Suggested Retail Price: $1,095. $1,390 with additional 16MB texture
module.
Rating...

...perspective correction flows. Limited documentation.
Bottom Line: Except for the REALimage based boards, the Intense **3D**
Pra was the fastest of all the boards we tested. It performed very well on
...

...Animation, and OpenGVR tests. We also noticed some perspective
correction faults in the animated Indy **3D** Image Quality screed (see
screed shot below). Neither of these were significant, and the overall...

...Intergraph's RenderGL MAX and ViZfx MAX software, this is probably the
ultimate board for **3D** Studio MAX users. It ought to perform very well
with just about any highend **3D** application.
Real **3D**
Star Fighter
Chipset: Intel 1740
Onboard RAM: 8MB SGRAM.
Operating System Support: Win95, NT 4.0.
Processor Support: Pentium
**3D** API Support: Open GL, D3D.
Features: Perspective corrected textures, Bilinear MIP mapping
Gouraud and specular...boards using the new intel 1740 chipset. Because of
its very low wholeslae price and **3D** feature set, we can expect to see
quite a few 1740-based consumer level boards...

...we tested and we especially liked the ability to save and load settings.
The space- **game** style installation routines, wheel easy to use are
obviously intended for general consumers and the...

...true ICD, this board should shine, Until then, we can't recommend it for
serious **3D** users working in NT.
STB
Velocity 128 (PCI)
Chipset: nVIDIA Riva 128.
Onboard RAM: 4MB SGRAM.
Operating System Support: Win95, NT 4.0
Processor Support: Pentium
**3D** API Support: Open GL, D3D, Heidi
Features: Perspective correction alpha blending/transparency,

bilinear and bilinear...

...AGP version available. Bundled with WIRL VRML Web Browser and VREAM VR
Creator, MicroGrafx Simply **3D** , and MediaMatics MPEG Player.
Suggested Retail Price: $199.
Rating: * * * * *
Pros: Excellent image quality. Good Win95...

...the D3D performance under Windows 95 was top-notch, this is probably
best as a **game** player's board Even under NT, the image quality was nearly
perfect see screen shot...

...offer a true ICD implementation of OpenGL, we can't recommend this board
For serious **3D** modelers or animators working or NT workstations.
Leadtek
WinFast **3D** L2520
Chipset: 3Dlabs GLINT MX & Delta, S3 Virge DX (2D).
Onboard RAM: 8MB frame, 16MB...

...Operating System Support: Win95, NT 4.0.
Processor Support: Pentium, Pentium Pro, Pentium II, Alpha.
**3D** API Support: OpenGL, Heidi.
Features: Support for meshed, depth-buffered triangles. Bundled with
Asymetrix 3DF...

...overall performance, flawless image quality (see screen shot below), and
good price push the WinFast **3D** L2520 to the top of the group of
GLINT-based offerings. The manual was good...

...and limited user-selectable settings. With more user settings and
application-specific presets, the WinFast **3D** L2520 would be nearly
unbeatable. For serious **3D** , animation, and modeling work, this is an
excellent choice.
Quantum **3D**
Obsidian 100SB-4400
Chipset: 3Dfx Voodoo.
Onboard RAM: 20MB.
Operating System Support: Win95, NT 4.0.
Processor Support: Pentium.
**3D** API Support: OpenGL, D3D, Glide, OpenGVS, DataPath RealiMation,
Cosmo, RenderWare, BRender, NETIMMERSE, SimStudio, Newfire Torch...
...effects. Texture morphing and animation. Gouraud modulated textures.
OpenGL compliant alpha blending. Anti-aliasing. RealiStorm **3D** Studio MAX
R2 plugin/driver for quick preview animation rendering.
Suggested Retail Price: $899 Bundled...

...FireGL 1000 Pro.) It reverted to the second board for some OpenGL tasks,
providing no **3D** acceleration at all. However, Glide versions of the
OpenGVS and Quake II tests ran three...

...GMX.
Onboard RAM: N/A.
Operating System Support: NT (and others).
Processor Support: N/A.
**3D** API Support: OpenGL, D3D, Heidi, QuickDraw **3D** .
Features: Integrated GLINT Gamma geometry accelerator. Hardware **3D**
geometry acceleration and **3D** lighting processing. Scalable rasterization.
AGP Linear, exponential, and exponential squared fog calculations. Aliased
or anti...based boards will start shipping.
How We Tested

In the past, when Inter Activity evaluated **3D** graphics accelerators, we would install the boards, install the drivers, and run them through a series of rendering tests. These tests would start with an application such as Softimage **3D** or Kinetix **3D** Studio MAX, We would create a primitive with 40,000 polygons, render to screen in...

...part, we left the factory default settings alone, except when there were specific options for **3D** Studio MAX or generic OpenGL performance. In some cases, the settings were modified to overcome...

...lndy3D or OpenGVS indicated one board was faster than the others, and our tests with **3D** Studio MAX and LightWave **3D** reached the same conclusion, we would know that the benchmarks were useful if on the...

...a sailboat sailing the San Francisco bay (Fig. 2). In the Animation test, an animated **3D** character walks down a city street (Fig. 3) All three of these tests measure polygon...1024x768) single- and double-buffered versions of GVF (flight simulator, Fig. 15) and GVR (racing **game** , Fig. 16).
  The OpenGVS series is geared toward simulation, animation, and **games** , but it can be a good indicator of how well a board handles large textures ...

...to another over and over again). This approach to animation is meat and potatoes for **3D** **games** , even though it's essentially a 2D technique. The Quake II test revealed weaknesses in...

...finally 1600x1200. The Quake II timings in the chart represent only the 640x480 test.
  * LightWave **3D** . Using NewTek Lightwave **3D** , we pulled up two scenes and timed rendering each one to the screen with everything...how well each board kept the screen refreshed and how smoothly objects could be manipulated.
  * **3D** Studio Max R2. The final testing was done with Kinetix **3D** Studio MAX R2. A reasonably complicated scene was chosen, starting with four objects, 7862 vertices...

...GMX boards begin shipping in spring '98.
  In many cases, we were supplied with beta **software** **drivers** or directed to download the latest and greatest drivers from a Web or FTP site ...

...to take advantage of special features. For example, Intergraph has a special plug-in for **3D** Studio MAX called RenderGL Max that enhances rendering to screen, compositing, special effects, and object...

...various bench marks, Sure enough, the E&S based boards did very well an Indy **3D** and the 3Dfx- based board did very well on OpenGVS. Some of the lower end, **game** oriented boards out performed the big boys when it came to running Quake ll. However...

...boards that performed well an Indy3D and OpenGVS tended to perform well when running LightWave **3D** and **3D** Studio MAX.
 **19980601**

(USE FORMAT 7 FOR FULLTEXT)
TEXT:
ERAZOR X(2) Offers Double Data Rate Memory for the Highest in  **3D**
Rendering
...    X(2) with Double Data Rate (DDR) memory architecture for the
mainstream market. This innovating  **3D**  graphics accelerator powered by
NVIDIA GeForce 256, the world's first graphics processing unit (GPU...

...allows the user to reduce the load on the computer's CPU and allows for
**3D**  **game**  scenery, which has over 50,000 polygons, to be displayed in a
quality not seen...

...The ERAZOR X(2) alone brings extreme performance to even the most
demanding T&L  **games**  available on the market, and when you add-in the
awesome ELSA  **3D**  REVELATOR stereo gaming glasses, we provide the ultimate
gaming experience."
     The ELSA  **3D**  REVELATOR stereo gaming glasses, optimized for T&L
functionality, add depth to  **3D**  **game**  graphics and immerses gamers into
more realistic, life-like  **stereoscopic**  **3D**  **game**  play not seen until
now.
     The ERAZOR X(2) comes with video-out for playing  **games**  on your TV,
plus smart utility tools integrated in the ELSA WINman Suite. The
GeForce(TM) 256 GPU is boosted by optimized  **ELSA**  **drivers**  and 32-MB of
DDR RAM. The  **ELSA**  **drivers**  support Windows 95/98 and Windows NT 4.0 with
support for Windows 2000 pending...

...to the board, ELSA will also be supplying the ERAZOR X(2) with an
exciting  **game**  sampler, plus the popular video-editing software
"MainActor." ELSA also provides a 6-year warranty...
 **20000210**

06265486     Supplier Number: 54357579  (USE FORMAT 7 FOR FULLTEXT)
**ELSA Announces Optimized Support for AutoCAD 2000 With ELSA GLoria and
  Synergy Professional Graphics Accelerators.**
PR Newswire, p8761
April 12, 1999
Language: English     Record Type:  Fulltext
Document Type: Newswire; Trade
Word Count:   739

...      is optimizing its workstation solutions for the AutoCAD 2000
product family with enhancements to ELSAview  **3D**  and POWERdraft 14 as part
of the current ELSA Software Advantage for AutoCAD R14. When...

...Autodesk products with unique performance and productivity advantages.
The recently announced ELSA Synergy II 2D/ **3D**  professional accelerator
will be demonstrated at the Autodesk One Team Conference this week.
      The ELSA...

...drivers and utilities that enable ELSA GLoria and Synergy accelerator
boards to achieve maximum 2D/ **3D**  graphics performance. With
implementations of specific extensions for AutoCAD 2000, ELSA delivers a
100% OpenGL driver optimized for AutoCAD 2000 users working in Windows NT.
The high performance **ELSA   driver** allows AutoCAD 2000 users to take
advantage of AutoCAD 2000's  **3D**  modeling and MDI (Multiple Document
Interface) capabilities with ELSAview  **3D**  and POWERdraft 14.
      ELSAview  **3D** , an integrated  **3D**  viewing and editing tool, adds to
the  **3D**  modeling functionality with productivity features that allow
AutoCAD 2000 users to view large assemblies; utilize **stereo**scopic
viewing; handle MDI updates; edit material, texture and color; output to
VRML and OpenInventor; and take advantage of multiple processor systems.
ELSAview  **3D**  also allows users to directly take advantage of ELSA hardware
for superior graphics acceleration. The current release of ELSAview  **3D**
can be downloaded from the ELSA Web site for a 30-day evaluation on any...

...early tests indicate their AutoCAD 2000 POWERdraft drivers are exceeding
expectations. We expect to see **ELSA** 's now **driver** /viewer suite rapidly
accepted keeping ELSA in a market leader position."
      The ELSA Software Advantage...

...Software Advantage, included with ELSA graphics boards, provides
professionals with performance and productivity advantages for  **3D**  OpenGL
and 2D applications, and bundled **software   drivers** and utilities for
AutoCAD and  **3D**  Studio MAX/VIZ. Exceeding a Mean score of 9 on the ProCDRS
tests, ELSA's...

...is the only driver worldwide delivering hardware acceleration for both
AutoCAD R13 and R14. ELSAview  **3D**  is a real-time  **3D**  editor and viewer
tightly integrated with AutoCAD R14, AutoCAD R13, MDT and ADT. The ELSA
Software Advantage also includes ELSA MAXtreme to deliver  **3D**  graphics
performance with a customized driver combining OpenGL, HEIDI, and ELSA
technology.
      ELSA leverages experience...

...and graphics to create high-quality drivers to accelerate professional
applications such as AutoCAD or  **3D**  Studio MAX. **ELSA** 's custom **drivers**
and tools are available to customers free-of-charge and are standard

components with every...

...Founded in 1980, ELSA has built a world-class reputation in high-performance 2D and **3D** graphics solutions for professional workstations, commercial desktop and consumer PCs. In addition, ELSA offers a...
**19990412**

06092406     Supplier Number: 53633026   (USE FORMAT 7 FOR FULLTEXT)
**StereoGraphics and ELSA Team to Provide High Performance** Stereo3D
  **Visualization Solution for Autodesk and Kinetix Applications.**
Business Wire, p0313
Jan 25, 1999
Language:  English     Record Type:  Fulltext
Document Type: Newswire; Trade
Word Count:   677

**StereoGraphics and ELSA Team to Provide High Performance** Stereo3D
  **Visualization Solution for Autodesk and Kinetix Applications.**
     ELSAview **3D** (tm) and MAXtreme(tm) Enable **Stereo3D** (tm) Visualization
        of Drawings in AutoCAD(R), Mechanical Desktop(R),
        **3D** Studio MAX(R) and **3D** Studio VIZ(tm)
     StereoGraphics, the world's leading supplier of **Stereo3D**
visualization products and ELSA, a leader in high performance graphics,
announced today that two software applications from ELSA, ELSAview **3D** and
MAXtreme, are now optimized to provide **stereoscopic** visualization of
Autodesk, Inc. and Kinetix applications through the use of StereoGraphics'
line of **Stereo3D** products and ELSA's high-performance GLoria cards for
professionals.
     Users of AutoCAD R14 and Mechanical Desktop from Autodesk and **3D**
Studio MAX and **3D** Studio VIZ from Kinetix can now see drawings in
**Stereo3D** though the use of StereoGraphics' CrystalEyes(R), CrystalEyes
Wired and Monitor ZScreen(R) products. ELSAview...

...GLoria(tm)-XL OpenGL accelerators.
     "This is the first time that full-featured, high performance
**stereoscopic** visualization has been available to design engineers who rely
on Autodesk and Kinetix products in...

...said Bob Derezinski, vice president, sales and marketing, StereoGraphics
Corporation. "The ability to view in **Stereo3D** with high performance ELSA
GLoria accelerators will open the door to a faster and more intuitive
design process for Autodesk and Kinetix users."
     "Enabling **Stereo3D** in ELSAview and MAXtreme allows us to add
substantial value to the solutions ELSA offers...

...Users of StereoGraphics' visualization products can see drawings,
models, animations and architectural designs in true **Stereo3D** , enabling
faster decision making, reduced errors and less reliance on physical
prototypes. This yields faster time-to-market and reduced overall design
costs.
     **Stereo3D** is the use of computer technology to recreate the way we
naturally see depth -- stereoscopically. **Stereoscopic** viewing describes
how we use both eyes -- each with a slightly different perspective -- to
perceive depth and perspective in a physical environment. **Stereo3D**
delivers the most realistic visual representation possible of complex
digital models, giving architects, engineers and scientists the best
possible understanding of **three - dimensional** information and yields
levels of technical proficiency not available using a typical **3D** view.
     ELSAview **3D** , a real-time **3D** editor and viewer, is tightly
integrated with AutoCAD R14 and Mechanical Desktop. In addition to
**Stereo3D** visualization capabilities, ELSAview **3D** now offers
full-featured **3D** capabilities such as light and material editing,
clipping functionality, and improved navigation interfaces to users.

**ELSA** MAXtreme, a specialized **driver** for 13D Studio MAX R2 and **3D** Studio VIZ R2, provides users with considerable performance and productivity gains in combination with ELSA GLoria professional graphic accelerators.

MAXtreme and ELSAview **3D** are part of the ELSA Software Advantage in OpenGL and application drivers. **ELSA** 's custom **drivers** and tools are available to customers free-of-charge and are standard components with every...

...Founded in 1980, ELSA has built a world-class reputation in high-performance 2D and **3D** graphics solutions in addition to a wide-ranging ISDN and videoconferencing product family.

About StereoGraphics

StereoGraphics Corporation is the world's leading supplier of **Stereo3D** (tm) visualization products. StereoGraphics' products allow engineers, scientists, architects and medical professionals to visualize large...

...a registered trademark of ELSA AG. StereoGraphics, CrystalEyes and Monitor ZScreen are registered trademarks and **Stereo3D** is a trademark of StereoGraphics Corporation. All names mentioned may be trademarks or registered trademarks...

**19990125**

**19/3,K/14      (Item 13 from file: 16)**
DIALOG(R)File  16:Gale Group PROMT(R)
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05244843     Supplier Number: 47995244   (USE FORMAT 7 FOR FULLTEXT)
**SMI's DualView enables two application displays at once**
Hachman, Mark
Electronic Buyers' News, p032
Sept 22, 1997
Language:  English     Record Type:  Fulltext
Document Type: Magazine/Journal; Trade
Word Count:   536

     While desktop graphics has concentrated on  3 - D  entertainment,
business-presentation software remains the dominant application of the
notebook PC user. With that...

...have introduced three products, including chips with a proprietary
high-performance embedded-DRAM interface and  3 - D  capabilities.
     Last week, SMI announced the SM910, a 64-bit, 2-D video accelerator
that...

...portion of it simultaneously on an FPD and a CRT monitor, SMI said that
its **Dual - View**  architecture is the first to output two completely
**separate   images**  on the two displays.
     Moreover, the two images can be uniquely shown at differing
resolutions...

...particular display, we can display two different applications at once,"
Kao said.
     By developing specialized **software   drivers** , SMI said that it can
offer this capability now, without waiting for the built-in **dual - view**
capabilities of Microsoft Corp.'s Windows 98 operating system.
     While the LCD panel, hard drive...

...the SM810, featuring the 910 core with 2 Mbytes of EDO-class embedded
DRAM. A  **3 - D**  part with 2.5 Mbytes of embedded SGRAM-class DRAM will
follow shortly after.
     "One...
 **19970922**

04757159    SUPPLIER NUMBER: 19476098    (USE FORMAT 7 OR 9 FOR FULL TEXT)
  3 - D **showdown. (includes related articles on Editors' Choice,
  Suitability to Task ratings, benchmark tests)(overview of 15 evaluations
  of 20  3 - D  graphics accelerators)(individual evaluation records
  searchable under "** 3D  **Showdown") (Hardware Review)(Evaluation)**
Ozer, Jan
PC Magazine, v16, n12, p185(12)
June 24, 1997
DOCUMENT TYPE: Evaluation    ISSN: 0888-8507    LANGUAGE: English
RECORD TYPE: Fulltext; Abstract
WORD COUNT:    4550    LINE COUNT:    00344

  3 - D **showdown. (includes related articles on Editors' Choice,
  Suitability to Task ratings, benchmark tests)(overview of 15 evaluations
  of 20  3 - D  graphics accelerators)(individual evaluation records
  searchable under "** 3D  **Showdown") (Hardware Review)(Evaluation)**

ABSTRACT:  Twenty graphics cards with 2D and  **3D**  capabilities priced under
$300 are reviewed. All the tested boards can display Windows 95 2D and  **3D**
accelerated graphics at 1,024-by-768 resolution. They all also include
16-bit color...
...majority of cards tested offer superb 2D performance, letting users
choose on the basis of  **3D**  performance and other features. The $290 ATI
Technologies All-In-Wonder is rated an Editors' Choice because it offers
good  **3D**  acceleration and top-notch 2D graphics, built-in video capture
and an on-board TV...

...is ideal for home multimedia use and for business use as well. The
Canopus Total  **3D**  bundle is a good choice for gamers, and several other
cards are honorable mentions suitable...

TEXT:
     PC Labs reviews 20 sub-$300 graphics accelerators with 2-D and  **3 - D**
capabilities using the new ZD  **3D**  Graphics WinMark benchmark test suite.
...     today with an eye toward the future, the focus must turn toward the
next frontier:  **3 - D**  graphics speed and quality.
     So far,  **3 - D**  graphics--rendering scenes and images with a lifelike
sense of depth--have been about  **games** . Popular titles such as Mech
Warrior 2 and Monster Truck Rally used  **3 - D**  landscapes and  **3 - D**
rendering effects to draw players into their worlds.
     Later this year, business users will be confronted by the first
productivity applications to offer  **3 - D**  functionality. While programs
such as Excel let you generate  **3 - D**  graphs and charts, the next
generation of business applications will use  **3 - D**  to create
representations of data to express a higher level of detailed information
at a glance. For instance, the quarterly statements from 50 stores could be
viewed on a  **3 - D**  map of the country. You could even include statements
from previous years by assigning them coordinates further away in the z-
axis.
     And on the Web, the current  **3 - D**  spinning logos and the like will
give way to more useful  **3 - D**  objects, such as products you can view from
all sides, and homes, vacation destinations, and...
...PC users. To be included, a board had to deliver Windows 95 2-D and  **3 -
D**  acceleration at 1,024-by-768 resolution, 16-bit color depth, and a
refresh rate...

...called true color)and still have the bandwidth to handle the extra memory demands of **3 - D** . The board had to have a street price of $300 or less and be new to the market since our last review of mainstream accelerators (" **3 - D** for Free," December 3, 1996), though we invited back two Editors' Choice winners from that...

...Fifteen vendors submitted a total of 20 boards, ranging from $75 (for Genoa's Phantom **3 - D** ) to $300 (for entries from ELSA and Leadtek). More than half of the boards were...

...newly released ViRGE DX chip--though as it turns out, popularity didn't equate with **3 - D** performance. Three boards were based on the Cirrus Logic GD5464 chip and three on Rendition...

...board was based on 3Dlabs' Permedia chip. ATI and Matrox debuted new versions of their **3 - D** chip sets, the ATI **3D** Rage II+ DVD and Matrox MGA 1164 SG.
ZD'S NEW **3D** WINBENCH
Since the 1990 introduction of the first dedicated graphics processor for Windows, chip and board makers have played a **game** of leapfrog, steadily improving 2-D graphics performance. Now we've seen the one-upmanship...

...in a real-world situation.
Until now there has been no industry-wide measurement for **3 - D** performance. In this issue PC Magazine introduces the **3D** Graphics WinMark test suite (developed by Ziff-Davis Benchmark Operation), which objectively measures **3 - D** acceleration. The performance differences it found among boards were significant--sometimes more than 3:1.
Our **3D** Graphics WinMark suite is a Direct3Dapplication; it measures how well a chip accelerates the specific...

...to as D3D) is an application programming interface (API) that standardizes communication between programs exercising **3 - D** functions and the graphics hardware that provides the functions. By supporting D3D, all **3 - D** applications should work seamlessly with all graphics cards that supply D3D drivers, including all the...

...have the D3D software subsystem (a component of Microsoft's DirectX development libraries) installed; most **3 - D** board vendors include it. When you load a **game** or application that requires D3D, the software queries your system to see if the proper...

...hardware, image quality can suffer; if software emulation is used, performance can suffer.
Our new **3D** Graphics WinMark suite exercises many of the functions defined in the Direct3D specification, measuring the number of frames displayed per second during the playback of carefully tailored **3 - D** sequences. It also takes into account the quality of the **3 - D** rendering modes--fog, transparency, specular highlighting, and more--for **3 - D** scenes. The result is expressed as a **3D** Graphics WinMarkscore, which represents an arithmetic average of the results produced by the ten tests.
MEASURING UP
The **3D** Graphics WinMark scores of boards in this review ranged from a low of 20 for Diamond's ViRGE VX-based Stealth **3D** 3000XL ($180 street) to a high of 64 for Leadtek's WinFast **3D** L2200 ($300 street), based on the Permedia chip from 3Dlabs. The 11 boards based on...

...the top on our 2-D benchmark tests, but landed at the bottom on the **3 -** D tests. After the Leadtek, three boards (from Canopus, Sierra, and

Intergraph) built around the Rendition Verite V1000 chip proved fastest in
3 - **D** acceleration.
What does this mean for your real-world experience? Performance will
vary based on the **3 - D** features used by the specific **game** or
application, but on some of our tests the lowest-scoring board played
scenes at...

...second, while the fastest board produced over 30 fps--a staggering
difference.
The subjective side-- **3 - D** visual quality--is tougher to quantify.
In general, we saw a number of shortcuts taken...

...0, a broad-based specification that defines Windows-based multimedia
file formats and APIs for **games** and other programs that interface with
graphics boards, sound cards, and input devices (such as...

...such as S3 and ATI) had to solicit support for their own proprietary,
chip-specific **3 - D** rendering schemes and convince **game** developers that
it was worthwhile to port popular titles to their chip platforms. This
helped create a good deal of confusion in the marketplace as to which
**games** would run with which graphics boards, and how well.
In DirectX 5.0, Microsoft extended...

...Draw PrimitiveAPI, which shields the developer from having to write an
execute buffer for each **3 - D** object in a scene. Draw Primitive is what
**3 - D** programmers will use to add **3 - D** functionality to their extant
applications; it should hasten the availability of **3 - D** -enabled
applications outside the **game** arena.
BUYING TODAY FOR TOMORROW
First, the bad news: **3 - D** acceleration technology is still in its
infancy, and advances are coming fast and furious. Like the leapfrog **game**
in the 2-D acceleration race of yore, every six months sees a doubling of
...

...far exceed the capabilities of the brand-new boards in this review (see
the sidebar " **3 - D** Breakthroughs Around the Corner"). Still, if you need
to commit today, there are several factors to consider in addition to **3 -
D** performance.
Most important is making sure the board can deliver an acceptable
refresh rate at...

...connect an antenna or cable feed. Beyond allowing you to have CNN (or
the big **game** ) playing in a window while you work, these cards can scan
and store the closed...

...to just about any television set. In addition to allowing you to play
computer-based **games** on your much larger television set, an
All-In-Wonder-equipped PC (or one with ATI's other entry here, the $235 **3D**
Graphics Pro Turbo PC2TV) can be used in a conference room to play
presentations on a TV set. These next-generation extras, plus fine 2-D and
**3 - D** acceleration, make the All-In-Wonder our Editors' Choice.
Graphics cards affect your computing experience more than any other
peripheral. Buy today for the best **3 - D** experience ever offered. But do
it knowing you may need to buy again in 18 to 24 months to leverage the
advances that are right around the corner.
Related article: **3 - D** Terminology.
Alpha blending is a way of allowing one object to show through another
to...

...jittering pixels.

Direct3D is an application programming interface (API) that standardizes communication between programs exercising **3 - D** functions and the graphics hardware that provides the functions.

Double buffering increases the number of...now so good, you can pay closer attention to a board's other attributes, particularly **3 - D** acceleration and creature comforts.

The All-In-Wonder ($290 street), from ATI Technologies, is a breakthrough product and wins Editors Choice. The board delivers top-tier 2-D and good **3 - D** acceleration with ATI's own **3D** Rage II+ DVD chip, so users have a board for today's 2-D Windows...

...D Windows acceleration, four boards are front-runners and deserve honorable mention: the Diamond Stealth **3D** 2000XL Pro ($135), the Hercules Terminator **3D** /DX ($150), the Matrox Mystique 220 ($180), and the STB Nitro **3D** ($150). They all deliver excellent 2-D performance, hassle-free installation, and handy display utilities. Note that their **3 - D** performance and the visual quality of their **3 - D** -rendered scenes is not state-of-the-art, so you may need to upgrade in a year if the applications you use begin to demand better **3 - D** support.

Finally, if **3 - D** fun tops your list, consider the Total **3D** bundle ($260 street) from newcomer Canopus, which also merits honorable mention. The Rendition Verite V1000-based board delivered the second-best **3 - D** acceleration in this review, as well as top-tier 2-D performance. Canopus, too, has gone the extra mile by including a strong software bundle, **stereoscopic** glasses, and a software utility that lets you turn any electronic image into a **3 - D** image on-screen.

Related article: How to Read the Suitability to Task Boxes
In 2...

...in this review had 2-D performance that earned a poor.

To score well in **3 - D** performance, a board had to rank at or near the top in our new **3D** Graphics WinMark test suite. Support for a range of Direct3D features helped a board's score, while incomplete or improper feature support detracted from it.

For **3 - D** visual quality, we inspected various **3 - D** -rendered scenes to see how well features and effects--texture mapping, transparency, fog, specular highlighting...

...need, most of these boards can deliver it. On the other hand, our new ZD **3D** Graphics WinMark test suite shows that **3 - D** optimization still has miles to go

What the Numbers Mean
2-D PERFORMANCE ANALYSIS: As...

...2-D performance except for the 3Dlabs Permedia-based board, which is built expressly for **3 - D** gaming. While a vendor might choose to highlight a board's high ZD Business Graphics WinMark 97 score, it means little: **3 - D** performance is the ultimate proving ground.

Although two boards--the Genoa Phantom **3D** /DX and the VideoLogic GrafixStar 750--tied with a top Winstone score of 38.6...

...1.5 points, which we round up to the next nearest whole number.

Note that **3D** Graphics WinMark results vary considerably against Winstone 97 scores. The **3D** Graphics WinMark detects subtle performance differences that won't necessarily **translate** into end-user experience. A 10- to 15-point **3D** Graphics WinMark spread won't reflect performance differences at current system performance levels, so be...WinMark scores. The Matrox Mystique 220's score increased by 4 points, and the Stealth **3D** 2000XL Pro's jumped by 11. However, Winstone 97 scores were not improved by GDI...

...MPEG decoders use proprietary drivers to engage the board's video scaling and color-space **conversion** algorithms, most vendors have yet to integrate Active Movie to work with their boards. Active...

...microsoft.com) and is installed on most new computers as a part of OSR/2.

      **3 - D** DUST SETTLES

    Optimizations for **3 - D** performance are going to take some time, as mainstream vendors learn to ride this new...

...as far as they have taken 2-D. Before the release of the new ZD **3D** Graphics WinMark suite (which debuts in this roundup), vendors' claims for **3 - D** features and performance were as wild as the early west. **3 - D** Graphics WinMark clarifies which **3 - D** features are important and gauges how well they are implemented.

    We were surprised to find that many **3 - D** rendering modes were supported by the chip set but improperly implemented (or engaged at all) by the **software driver**. This was true (to a varying extent) for all the boards except our reference board...

...due to an either flawed or unfinished implementation in the driver (or chip).

    The Interactive **3 - D** Quality tests determined which **3 - D** modes were correctly supported by the board. If a board supports the rendering modes required...

...that when the Matrox Mystique 220 was forced to use the HEL for lack of **3 - D** mode support, it slowed to less than one frame per second on the Low- and...

...in this review, scenes run under the HEL ran at less than 1 fps.

    The **3D** Graphics WinMark score is based on the compilation of ten **3 - D** rendering tests. Therefore, running the tests in software decreases the board's overall score. Likewise...

...were the ATI boards and the 3DFX reference board. (For a complete description of our **3 - D** Graphics WinMark test suite, see "A New Standard in Windows **3 - D** Testing" in the Lab Notes section of this issue.)

    Although boards that support **3 - D** rendering modes in hardware were faster performers, our tests disclosed rough edges that impacted image...

...tested didn't do so. Some textures appeared smeared or were mapped incorrectly under Direct **3D**.

    The 3Dlabs Permedia-based board, the Leadtek WinFast **3D** L2200, was the top **3 - D** performer overall (except for our reference 3DFX). Its drivers, however, appeared to gain speed with...

...image quality in the Islands scene test. The Matrox Mystique 220 failed most of the **3 - D** tests, because it doesn't support fog, bilinear filtering, or specular highlighting. Since it doesn...HEL.

    Chip sets--except for those on the 3DFX reference board and the Leadtek WinFast **3D** L2200--didn't implement specular highlighting correctly. Vendors may have omitted this feature because it...

...configured the display to 1,024-by-768 resolution with 16-bit color. For the **3 - D** tests, we used 640-by-480 resolution with 16-bit color.

    The **3D** Graphics WinMark tests fall into three categories--low, medium, and high complexity--based on the...

**19970624**

12937232      SUPPLIER NUMBER: 68534450      (USE FORMAT 7 OR 9 FOR FULL TEXT)
**Display enhancements accept no compromises (1).(Technology Information)**
Dipert, Brian
EDN, 45, 25, 47
Dec 7, 2000
ISSN: 0012-7515      LANGUAGE: English      RECORD TYPE: Fulltext
WORD COUNT:   3707    LINE COUNT:   00293

TEXT:
     WOULDN'T THE PRODUCT YOU'RE DESIGNING BE EASIER TO CONCEIVE IF IT
APPEARED **THREE - DIMENSIONAL** ? A NEW BREED OF **STEREO   VISION** GLASSES
AND EXOTIC DISPLAY TECHNOLOGIES MAKE YOUR  **3 - D**  DREAMS COME TRUE.
     Modern graphics hardware and software labor mightily to deliver a
lifelike  **3 - D**  presentation to your eyeballs and brain. Perspective
control, graduated lighting and shadows, high-resolution and...

...uses this combined-image spatial perception, along with other visual
cues, to mentally construct a  **3 - D**  representation of the scene.
     Now take the experiment one step further. First, place your finger
...
...person to another.
     (Figure 1 ILLUSTRATION OMITTED)
     DOUBLE VISION
     To create the most realistic-possible  **3 - D**  representation of a
scene, a computer must generate unique image versions for each eye.
Remember the old View-Master **stereo   viewers** ? Each picture on the reel
(or card for the even older  **stereoscopes** ) comprised two unique images,
photographed or drawn from slightly different perspectives. Bulky,
expensive, and unattractive...

...attempted to solve the image-isolation problem with color filters. Such
forgettable movies as Jaws  **3 - D**  and Friday the 13th: Part 3 used a
single-lens projector, with each frame of...

...one color, and the other image contained an excess of another color.
When viewers wore  **3 - D**  glasses, the blue or red filter in front of each
eye partially blocked transmission of...

...the images. Reference 1 shows a still-image representation of this
technique. Color-filter-derived  **3 - D**  technology has numerous
shortcomings. The filters give the scene an unrealistic color mix, for
which the brain can only partially compensate; the  **3 - D**  effect varies
depending on your location in the theater. Unless you correctly position
the glasses...

...filters. The cost of both the glasses and the dual-duty projector has
prevented this  **3 - D**  technique from breaking into the movie mainstream.
     Recall that at greater than 30 fps (frames...

...the required frame-per-second figure, as does the fact that fast-paced
interactive computer **games**  require low latency between the user's actions
and the display reactions. Suffice it to say, then, that many  **3 - D**
-graphics users demand at least  ...must consider as they come up with
lower cost alternatives to heads-up displays for **stereo - image**  viewing.
The most common technique they employ involves glasses with LCD "shutters"
that alternately darken...

...subpixels and their grouping, the system can project images to each eye
for a stereo **3 - D** effect (Figure 3). Keep in mind, though, that the
subpixel rendering used here is subject...

...OMITTED)
   WHERE'S YOUR HEAD?
   Now that you know the various options available to display **stereo
images** , back up and consider how the graphics hardware and software create
the images in the...

...to tell it how far away each of the pixels is that comprises each
displayed **3 - D** object. The Z-buffer, a per-pixel memory array containing
nonlinear depth values of 0...

...it should render in front of the other. If a program is incompatible
with a **stereo - vision** display, it may be because the program bypasses
the Z-buffer and controlling API and...

...the final piece of data that is valuable to graphics hardware and
software when generating **stereo images** . Is every computer user's head
always exactly centered in front of the monitor and...standard
single-monitor setup, look at the custom graphics drivers that Elsa
developed for its **3 - D** Revelator glasses (Figure 5). A one-time
configuration utility enables you to set the monitor...

...clipping window that determines which portion of the scene is displayed.
   (Figure 5 ILLUSTRATION OMITTED)
   **Elsa 's drivers** also support the optional Dyna-Z feature, which
dynamically alters the stereo effect depending on...
...vendors develop for their chips. This reality puts quite a
software-development burden on the **3 - D** -glasses or display manufacturer,
sometimes with undesirable consequences. The drivers might only communicate
with the...

...needs to create each image, coupled with the fact that it's now creating
two **stereo images** for every one that users view the "normal" way, can
cause the frame rate to plummet. But don't let these disadvantages prevent
you from at least trying out a **3 - D** stereo monitor or pair of glasses.
Match them with the right graphics card and software, and the results will
amaze you.
   TRUTH IN ADVERTISING
   Just a few years ago, **3 - D** stereo glasses cost hundreds or
thousands of dollars, were bulky and heavy, and generated so...

...it was with no lack of skepticism that I approached an evaluation of·
Elsa's **3 - D** Revelator glasses. A wired version that supports
simultaneous operation by as many as four users...

...in a Pentium III 133/533 system using Intel's VC820 motherboard), and
Creative Labs' **3 - D** Blaster, based on Nvidia's TNT2 Ultra (installed in
a Pentium III 100/600 system...
...S3-based graphics boards, but in recent months Elsa has added support
for other companies' **Nvidia** -derived products. **Driver** installation was
uneventful with both systems, and Elsa includes a utility that lets you
toggle...

...installed and intended for your board. Unlike previously developed
stereo glasses from other manufacturers, the **3 - D** Revelators required no
installation of any special application-specific patches.

The visual quality of **games** such as Acclaim Entertainment's Forsaken, Criterion Studio's Redline Racer, and Rage Software's Incoming has always impressed me. Elsa's stereo glasses generate an enhanced **3 - D** effect that takes graphics to a whole new level of realism and, frankly, blew me...

...increased the depth perception.

Frame-rate impacts were unnoticeable in most cases. Most times, the **games** were still playable at their original quality, colordepth, and resolution settings, though with the older...I wanted to try Quake III and Unreal Tournament and because digital-content-creation (CAD, **3 - D** modeling, and others) software capability also would have been cool. Limited program-specific OpenGL support...

...OpenGL wrapper for DirectX, but I've heard that it lets you play OpenGL-based **games** and doesn't significantly cripple performance.

At press time, **Elsa** 's **drivers** were based on **Nvidia** 's 5.31 **driver** version, many months removed from Nvidia's state of the art. But considering the price of the glasses and the plethora of DirectX-based applications out there, the **3D** Revelator glasses are a great value. Check 'em out. Also, take a look at the **3 - D** still images and video clips sold by i-O Display Systems, whose LCD technology many...

...the following manufacturers directly, please let them know you read about their products in EDN.

**3 - D** STEREO GLASSES

AnotherWorld +8241-337-2468 www.anotherworld.to Enter No. 396

Artificial Parallax Electronics...

...com Enter No. 408

Woobo +82-2-5466-006 www.woobo.com Enter No. 409

**3 - D** STEREO DISPLAYS

Dimension Technologies 1-716-436-3530 www.dti3d.com Enter No. 410

Dresden **3D** Display +49-351-463-0 www.inf.tu-dresden.de/D4D Enter No. 411

Elsa...

...depts/mes/ Research/Groups/vvr/vrsig97/ proceed/008/hasdpape.htm www.cuni.cz/~pavlik/skola/ **3d** / autostereoscopy/rhs.htm Enter No. 416

...DESCRIPTORS: **Three - dimensional** graphics

**20001207**

10069752     SUPPLIER NUMBER: 20395967     (USE FORMAT 7 OR 9 FOR FULL TEXT)
**New AGP Graphics Accelerator From ELSA Provides High-Performance** 3D
  **Graphics**
PR Newswire, p316SFM075
March 16, 1998
LANGUAGE: English     RECORD TYPE: Fulltext
WORD COUNT:  560     LINE COUNT:  00052

**New AGP Graphics Accelerator From ELSA Provides High-Performance** 3D
  **Graphics**
...     ELSA, Inc. (Santa Clara, CA) today announced the GLoria(TM)-XXL, a
new high-end **3D** graphics accelerator designed to meet the demanding
requirements for CAD modeling, animation, and visualization applications...

...monitors .
     GLoria-XXL uses a 48-bit local buffer interface to enable
simultaneous use of **3D** features such as front and back buffer, Z-buffer,
stencil, fast clear planes, and graphics ID. ELSA GLoria-XXL also supports
**stereoscopic** **3D** imaging through a VESA(R)-standard connector.
     GLoria-XXL will support a wide range of high-performance **3D** APIs,
including OpenGL(R), HEIDI(TM), and Direct3D(R). With **ELSA** 's optimized
**drivers** , GLoria-XXL provides an ideal solution for professionals using
CAD/CAM/CAE applications such as...

...R), AutoDesk(R) Mechanical Desktop, EDS/Unigraphics, IDEAS(TM),
MicroStation(TM) 95, and Softimage(R) **3D** .
     Quotes
     "ELSA is excited to continue our long-standing relationship with
3Dlabs and offer graphics professionals the latest generation of **3D**
accelerator for the PC," said Thomas Neubert, vice president of marketing
and sales at ELSA. "GLoria-XXL provides robust **3D** performance at a price
dramatically lower than traditional UNIX workstations, while enabling
customers to fully exploit the power of Windows NT(R)."
     "ELSA's engineering expertise, particularly in **software** **driver**
technology, brings its customers an excellent **3D** graphics solution," said
Neil Trevett, vice president of marketing at 3Dlabs. "We are pleased that
...

...GLINT technology."
     "The GLoria-XXL appears to be an ideal solution for professional
animators using **3D** Studio MAX," said Phillip Miller, product manager of
**3D** Studio MAX at Kinetix. "The **ELSA** OpenGL **driver** now supports dual
planes within MAX R2, delivering an incredible speed increase over
traditional OpenGL...

...Founded in 1980, ELSA has built a world-class reputation in
high-performance 2D and **3D** graphics solutions in addition to a wide
ranging ISDN and videoconferencing product family.
     NOTE: The...

**19980316**

**19/3,K/23      (Item 5 from file: 148)**

06762665      SUPPLIER NUMBER: 14763959      (USE FORMAT 7 OR 9 FOR FULL TEXT)
**Cyberbook notebooks reach out for users with  3 - D  displays. (VRex Inc.'s
  notebook computers retrofit Apple Macintosh PowerBook 180c, Panasonic
  CF-V21P notebooks with screen overlay) (Brief Article) (Product
  Announcement)**
Lee, Yvonne L.
InfoWorld, v15, n48, p30(1)
Nov 29, 1993
DOCUMENT TYPE: Product Announcement      ISSN: 0199-6649      LANGUAGE:
  ENGLISH      RECORD TYPE: FULLTEXT
WORD COUNT:   260    LINE COUNT:  00020

**Cyberbook notebooks reach out for users with  3 - D  displays. (VRex Inc.'s
  notebook computers retrofit Apple Macintosh PowerBook 180c, Panasonic
  CF-V21P notebooks...**

TEXT:
     ...more depth to their presentations can get it from a New York state
company offering **three - dimensional  stereoscopic** notebooks with a
projection panel system.
 ...      or overhead·projection panel while wearing polarized glasses, the
image appears to pop out in  **3 - D** .
     The CyberBook notebooks are actually Panasonic CF-V21P and Macintosh
PowerBook 180c notebooks that VRex Inc. outfits with a screen overlay.
     Users can view  **3 - D**  images directly on the CyberBook screen or
project them using the company's $8,995...

 ...Y., company demonstrated the notebooks displaying spreadsheet charts,
drawings, and bit-mapped images.
     To view **three - dimensional**  images, users need the notebooks, any
polarized glasses, and the company's Spatial **Multiplexor** (SMUX) **software**
 utility.
     The Windows- and Mac-based SMUX software creates two **separate
images**  of a graphic, one to be viewed by the left eye and the other by...

 ...splits up the images, displaying portions of each on alternating screen
rows that appear in  **3 - D**  when viewed through polarized lenses.
     A Macintosh PowerBook 180c-based CyberBook with 4MB of RAM...

     **19931129**

00291745 20000601153B2744 (USE FORMAT 7 FOR FULLTEXT)
**Fire GL Introduces Two New Accelerators for the Professional Workstation Graphics Market**
Business Wire
Thursday, June 1, 2000 09:18 EDT
JOURNAL CODE: BW LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
DOCUMENT TYPE: NEWSWIRE
WORD COUNT: 1,143

**2000**

TEXT:
...200, the Fire GL2 is ideally suited as a
mid-range solution for MCAD and **3D game** development. The Fire GL1(TM), priced
at $699, will continue to deliver stability and reliability for entry-level
professional **3D** applications."

...of data into the graphics
accelerator and avoid the common bottlenecks found in the traditional **3D**
pipeline of other products. The IBM GT 1000 geometry engine featured in the
Fire GL2...

...new Fire GL accelerators will
be a nice complement to the award-winning Pro/ENGINEER **3D** mechanical design
software suite and will enhance the product development process across many
manufacturing industries...

...accelerators provide enhanced broadcast video support, including bilinear
scaling, video overlays and a YUV-RGB **converter** for video and textures.
The
integration of professional broadcast video as a feature set of the new Fire
GL accelerators is intended to support the anticipated growth in the **3D game**
development and animation markets. The Fire GL3 also provides full scene
anti-aliasing to meet...

...with Softimage
software, will offer our customers a complete suite of creative tools that
integrates **3D** , 2D and video."
The Fire GL2 and Fire GL3 accelerators include advanced **software drivers** that
are optimized for the top **3D** graphics applications in the areas of CAD/CAM,
digital content creation and animation, and visualization...

...and
other tools. Both the Fire GL2 and Fire GL3 accelerators also provide
quad-buffered **stereo graphics** support.

The Fire GL line of professional graphics accelerators are fully optimized
for
Intel's...

...the Fire GL1 with 32MB of memory and
AGP 2X support provides enhanced 2D and **3D** graphics acceleration. The
Fire GL2
delivers mid-range professional **3D** graphics acceleration, supports AGP
2X/4X
and comes with 64MB of memory. For more advanced needs, the Fire GL3 is a
high-end **3D** graphics solution with 128MB of memory and AGP Pro 50 support
that
sustains two monitors...

10038288  (USE FORMAT 7 OR 9 FOR FULLTEXT)
**Electrohome Limited's Fakespace Systems unit joins with HP to expand
   availability of visualization solutions**
CANADA NEWSWIRE
March 13, 2000
JOURNAL CODE: WCNW    LANGUAGE: English   RECORD TYPE:  FULLTEXT
WORD COUNT:  937

   (USE FORMAT 7 OR 9 FOR FULLTEXT)

...       the two  companies are discussing future joint marketing programs
and  collaboration  on the development of **software   drivers** to integrate
Fakespace Systems immersive displays with HP visual computing systems.
      To demonstrate virtual prototyping...

... Larson, solution specialist for HP's Technical Computing Division. "The
integration  of  large-scale  and  **stereoscopic** displays  from Fakespace
Systems  with  HP VISUALIZE workstations means that organizations that rely
on the...

...computing industry's broadest range of immersive displays for designers,
engineers  and researchers working with **three - dimensional** ( **3D** ) models
and  complex  graphical  data.  These  include  the  ImmersaDesk  family of
workbench-type virtual model...

...a number of best-of-class subsystems from third-party vendors.
      To  support real-time, **stereoscopic** visualization and interactivity,
Fakespace  Systems  displays  use CAVELib(TM)  and  trackd(TM)  software
developed by...

... and  distributed  by VRCO  (Chicago,  Illinois).  These Application
Programming  Interfaces (APIs), which provide drivers for **stereo   viewing**
, head  tracking, navigation, and hands-on interactivity, support commonly
used visualization software, such as Division...

   **20000313**